Ephemerides K. 756. a. 2

PR 2465

THE Gentleman's Diary,

OR THE

MATHEMATICAL REPOSITORY;

An ALMANACK

For the YEAR of our LORD 1752.

Being the BISSEXTILE, or LEAP YEAR.

Containing many uſeful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the Study and Practice of the

MATHEMATICKS.

The Twelfth *Almanack* ever publiſh'd of this Kind.

——— Quâ causâ argentea Phœbe
Paſſibus haud æquis graditur; cur ſubdita nulli
Hactenus Aſtronomo numerorum fræna recuſat:
Cur remeant Nodi, curque Auges progrediuntur.
——— Quantis refluum vaga Cynthia pontum
Viribus impellat; dum fractis fluctibus ulvam
Deſerit, ac Nautis ſuſpectas nudat arenas,
Alternis vicibus ſuprema ad littora pulſans.

LONDON,
Printed for the Company of STATIONERS.
MDCCLII.

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JANUARY hath xxxi Days.

New Moon 5 Day at 51 m. past 2 in the Aftern.
First Quarter 13 Day at 17 m. past 3 in the Morn.
Full Moon 19 Day 46 Min. past 7 at Night.
Last Quarter 27 Day 18 m. past 5 in the Morn.

M D	D place
1	6 ♑ 41
6	6 ♒ 39
11	11 ♈ 9
16	21 ♊ 17
21	4 ♋ 17
26	9 ♌ 8

NS	OS			☉ Rises	☉ Sets	☽ Rises	☽ Sets	W. fast.
12	1	W	Circumcil. New Years Day, now	4 M 33	8 M 37			
13	2	Th	begins the Year of our Lord 1752	5 2	9 25			
14	3	F	Notting. Epiph. Fair is al-	6 1	10 14			
15	4	S	ways the 1st Fr. aft. 2d. of Jan.	6 53	11 2			
16	5	E	Sunday after Christmas.	Sets	11 50			
17	6	M	Epiph. CHRIST's Star appears	5 A 28	6 A 37			
18	7	Tu	Days are now 8 ho. to Gentiles	6 39	1 23			
19	8	W	Lucian, Priest and m.	7 48	2 8			
20	9	Th	*The Weather (in General) this Year*	9 0	2 54			
21	10	F	*is likely enough to be pretty*	10 13	3 40			
22	11	S	*much the same as in former Years*	11 26	4 27			
23	12	E	1 Sunday after Epiphany.	Morn.	5 17			
24	13	M	Hillary. Bish. and Con.	0 42	6 11			
25	14	Tu	*Notwithstanding the agreeable and*	1 57	7 8			
26	15	W	*necessary Regulation of the* Style.	3 11	8 7			
27	16	Th	Day 8 ho. and half, and	4 16	9 8			
28	17	F	Night 15 hours and half long.	5 13	10 9			
29	18	S	Prisca, Rom. V. and M.	6 0	11 8			
30	19	E	2 Sunday after Epiphany	☽ Rises	Morn.			
31	20	M	Fabian B. of Rom M. Oct. Hill.	6 A 5	0 14			
Fe	21	Tu	Agnes Rom. V. and M. [1. Ret.	7 22	0 56			
2	22	W	Vinc. Span. Deac. M.	8 38	1 45			
3	23	Th	Hillary Term begins.	9 51	2 34			
4	24	F	*Wet and Cold; or* (perhaps)	11 0	3 20			
5	25	S	Conversion of Saint PAUL.	Morn.	4 5			
6	26	E	Septuagesima Sunday.	0 9	4 52			
7	27	M	Quind. Hill. 2 Ret	1 14	5 38			
8	28	Tu	*Fair and Frosty; however Remember*	2 15	6 23			
9	29	W	*We expect no Harvest Weather now*	3 12	7 14			
10	30	Th	K. CHARLES I. martyr'd	4 2	8 2			
11	31	F	Whitehall 12 m. past 1, 1649	4 48	8 50			

M D	☉ Rises	☉ Sets	♄ Rises	♅ Sets	♂ Sets	♀ Rises	♃ Sets	W. fast.
1	8 7	3 53	5 M 51	4 M 2	☽ M 29	☉ M 20	5 A 37	9 00
6	8 1	3 59	5 32	3 59	☽ 2	4 27	5 30	10 3
11	7 54	4 6	5 14	3 39	☽ 22	4 33	5 11	12
16	7 45	4 15	4 55	3 17	☉ 17	4 39	Rises	13 1
21	7 37	4 23	4 36	2 55	☉ 14	4 46	6 M 44	14 0
26	7 28	4 32	4 18					

FEBRUARY hath xxix Days.

M D	☽ place
1	20♑33
6	24♑30
11	3♒10
16	14♌23
21	22♎ 9
26	22♐38

New Moon 4 Day 46 m. past 7 in the Morning.
First Quarter, 11 Day at Noon.
Full Moon 18 Day at 8 in the Morning.
Last Quarter 26 Day 20 m. past 2 in the Morn.

N S	O S	D W	Sundays, Holydays, remarkable Days Length, Inc. and Dec. of Days, Terms, Weath. &c.	Moons Rising and Set.	Moon South.
12	1	S	*Winterly ſtill; and not very*	5 M 20	9 M 38
13	2	E	Sexageſima. Purification V. M.	5 51	10 26
14	3	M	**Blaiſus**, B. and M. Cr. p. 3. Ret.	6 16	11 12
15	4	Tu	*unlikely for a Candlemas-Blaſt.*	☽ Sets	0 A 1
16	5	W	**Agatha** Sicilian V. and M.	6 A 45	0 48
17	6	Th	Day 9 hours and 3 quarters,	7 56	1 34
18	7	F	Night 14 ho. and 1 quarter long.	9 12	2 22
19	8	S	☉ Ampl. 18° 30′ South.	10 28	3 12
20	9	E	Quinquageſ. Shrove Sunday.	11 44	4 5
21	10	M	Octab. Purif. 4 Returns.	Morn.	5 1
22	11	Tu	Days increas'd, 2 ho. 54 min.	0 58	5 59
23	12	W	Aſh Wedneſd. firſt Day of Lent.	2 6	6 58
24	13	Th	Hillary Term ends.	3 5	7 56
25	14	F	**Valentine** Biſh. and M.	3 52	8 55
26	15	S	*Snow or Sleet* (perhaps) *Rain,*	4 32	9 52
27	16	E	1 Sunday in Lent.	5 5	10 45
28	17	M	*or,* (poſſibly) *fair and pleaſant,*	5 35	11 35
29	18	Tu	*the Seaſon conſidered.*	☽ Riſe	Morn.
M	19	W	Ember Week	7 A 29	0 25
2	20	Th	Days 10 hours and 52 min.	8 42	1 11
3	21	F	Night 13 hours 8 min. long.	9 52	2 0
4	22	S	Princeſs of HESSE born.	11 2	2 45
5	23	E	2 Sunday in Lent. [Notting.	Morn.	3 34
6	24	M	St. MATTHIAS A. M. Fair at	0 4	4 21
7	25	Tu	Nights are now ſhorten'd, and	1 4	5 10
8	26	W	the Days lengthen'd 3 ho. 3 qu.	1 55	5 57
9	27	Th	*Now and to the End, expect the*	2 41	6 46
10	28	F	*Weather to be full as good as any is*	3 20	7 34
11	29	S	*to be had this Month.* &c. &c. &c.	3 54	8 22

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Set	♀ Riſes	☿ Riſes	W. faſt
1	7 17	4 43	3 M 56	2 M 15	☌ M 1	M 0	6 M 7	14 46
6	7 7	4 53	3 38	1 58	0 ☍	4	6 4	14 35
11	6 57	5 3	3 21	1 41	0 ☍	7	6 4	13 54
16	6 45	5 15	3 4	1 24	0 ☍	8	6 2	13 0

MARCH hath xxxi Days.

New Moon 4 Day 37 min. past 9 at Night.
First Quarter 11 Day 3 min. past 7 at Night.
Full Moon 18 Day 5 min. past 9 at Night.
Last Quarter 26 Day 18 min. past 10 at Night.

M D	☽ Signs
1	10 ♒ 59
6	17 ♈ 36
11	23 ♉ 26
16	7 ♊ 54
21	12 ♋ 35
26	17 ♌ 18

NS	OS			☉ Rises	☉ Sets	☽ Rises	☽ Sets
12	1	D	3 Sun. in Lent. David Archb. M.	4 M 23	9 M 9		
13	2	M	Cedde or Chad B. Litch.	4 46	9 56		
14	3	Tu	☉ rising Amplitude 3° 38′ South.	5 10	10 43		
15	4	W	*Now* (be sure) *of* March Winds	☽ Sets	11 31		
16	5	Th	*from some Point of the Compass*	7 A 0	0 A 21		
17	6	F	*or other*; perhaps *Wet, perhaps Dry*	8 17	1 12		
18	7	S	Perpetua Maurit. Mart.	9 34	2 5		
19	8	D	4 Sund. in Lent, or Midlent S.	10 50	3 0		
20	9	M	☉ in ♈ 47 min. past 4 Morn.	Morn.	3 58		
21	10	Tu	Equal Day and Night in all the	0 1	5 0		
22	11	W	habitable Parts of this Globe.	1 6	5 58		
23	12	Th	Greg. M. B. of R. and C.	1 57	6 57		
24	13	F	*A good Season for the industrious,*	2 40	7 52		
25	14	S	Prince EDWARD born.	3 14	8 44		
26	15	D	5 Sunday in Lent.	3 42	9 35		
27	16	M	☉ Due E. 6. ho. 7. m. his Alt.	4 8	10 25		
28	17	Tu	*laborious, honest Farmer* [2° 57′.	4 32	11 12		
29	18	W	Ed. K. of West. Sax.	☽ Rise	11 59		
30	19	Th	☉ Amplitude North 7°	7 A 42	0 M 22		
31	20	F	*may be expected (with regard*	8 51	0 46		
A	21	S	Benedict Abbot.	10 1	1 33		
2	22	D	6 Sunday in Lent. Palm Sund.	10 59	2 25		
3	23	M	*to the Weather) now and*	11 54	3 10		
4	24	Tu	Day 13 hours 4 min. long.	Morn.	3 58		
5	25	W	Annunciation B. V. Mary.	0 42	4 46		
6	26	Th	Fair at Nottingham.	1 24	5 35		
7	27	F	GOOD FRID. Our SAV. Crucif.	1 59	6 23		
8	28	S	*to the End of this Month.*	2 28	7 5		
9	29	D	EASTER DAY. Our SAV. Rest.	2 53	7 54		
10	30	M	Easter Monday.	3 18	8 41		
11	31	Tu	Easter Tuesday.	3 40	9 28		

M	D	☉ Rises	☉ Sets	♄ Rises	♃ Sets	♂ Sets	♀ Rises	☿ Rises	W. fast
1		5 19	5 42	2 M 14	0 M 42	0 M 7	5 Mo 5	5 M 56	10 14
6		6 6	5 55	1 55	0 28	0 7	5 1	5 54	8 31
11		5 56	6 8	1 38	0 14	0 7	4 57	5 49	7 0
16		5 45	6 19	1 2	0 0	0 6	4 51	5 43	5 45
21		5 36	6 29	1 4	11 A 43	0 6	4 45	5 37	3 15
26		5 25	6 39	0 48	11 30	0 6	4 38	Set.	1

APRIL hath xxx Days.

New Moon 8 Day 56 min. past 8 in the Morn.
First Quarter 10 Day 36 min. past 1 in the Morn
Full Moon 17 Day 19 min. before Noon.
Last Quarter 25 Day 32 min. past 3 Afternoon.

M D	Moons Signs
1	28 ♓ 20
	10 ♊ 10
1	♌ 5
	26 ♎ 57
	26 ♐ 47
26	26 ♒ 58

NS	OS			☽ Sets	☽ Rises
12	1	W	All Fools-Day.	4 M 5	10 M 7
13	2	Th	*This Month is very likely*	4 28	11 7
14	3	F	Richard Bish. of Chich.	☽ Sets	0 A 2
15	4	S	St. Ambroſe, Biſh. of Mil..	8 A 40	0 58
16	5	D	1 Sund. after Easter. Low Sund.	9 56	1 58
17	6	M	Day 13 ho. 58 min. and Night	11 4	2 59
18	7	Tu	10 hours and 2 min. long.	Morn.	4 0
19	8	W	*to begin with ſome ſort of*	0 1	4 58
20	9	Th	*Weather, which (if Rain) may*	0 45	5 55
21	10	F	*be called* April Showers;	1 23	6 48
22	11	S	*and may reaſonably go on*	1 53	7 39
23	12	D	2 Sunday after Easter. Miſericor.	2 19	8 29
24	13	M	Quind. Paſch 1 Return. [16° 42′	2 44	9 15
25	14	Tu	☉ due E. 6ho. 41 min. Altitude	3 5	10 2
26	15	W	Prince WILLIAM born. E. T. beg	3 28	10 48
27	16	Th	*in the ſame Denomination;*	3 51	11 34
28	17	F	*Cold Harſh Winds, and*	☽ Riſes	Morn.
29	18	S	*Froſt expected, now and*	8 A 55	0 22
30	19	D	3 Sunday after Easter. Jubilate	9 51	1 10
M	20	M	Treſ. Paſch. 2 Return.	10 42	1 58
2	21	Tu	☉ riſes Amplitude 26° 19′ North	11 27	2 46
3	22	W	*till* May-Day, *or thereabouts,*	Morn.	3 35
4	23	Th	St. GEO. Fav. Cha. and For. M.	0 5	4 23
5	24	F	*however, expect*	0 35	5 8
6	25	S	St. MARK the Evangeliſt.	1 3	5 55
7	26		4 Sunday after Easter. Cantate.	1 25	6 39
8	27	M	Menſ. Paſch 3 Return.	1 49	7 25
9	28	Tu	*fine ſpringing Weather*	2 10	8 10
10	29	W	*now and to the End.*	2 32	8 58
11	30	Th	Days increas'd, 8 hours 9 min.	2 58	9 50

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Sets	♀ Riſes	♅ Sets	W. faſt
1	5 12	6 49	0 M 23	11 A 13	0 M 14 M	28 7 A	35	0 0
6	5 2	6 59	0 4	11 1	11 A 59 4	21 8	24	Slow.
11	4 53	7 8	11 A 42	10 48	11 55 4	12 9	0	1 45
16	4 45	7 16	11 21	10 34	11 50 4	2 9	29	2 40
21	4 36	7 31	11 2	0 21	11 46 3	54 9	45	3 0
26	4 2	7 41	10 41	10 5	11 41 3	45 9	46	3 45

MAY hath xxxi Days.

New Moon 2 Day 58 m. past 5 in the Evening.
First Quarter 9 Day 37 min. past 8 in the Morn
Full Moon 17 Day 38 min. past 2 in the Morn
Last Quarter 25 Day 19 m. past 5 in the Morn

M D	Moon's place
☽	4 ♓ 44
☾	19 ♊ 10
11	28 ♍ 0
16	29 ♎ 47
21	29 ♑ 0
26	1 ♈ 17

NS	OS			☉ Sets	☽ Sets	☽ Rises
12	1	F	St. PHIL: and JAC. or May-day	3 M 27	10 M 44	
13	2	S	☉ 15h. and half ☉ eclip. invi[s].		☽ Sets	11 42
14	3	D	5 Sun. after Easter. Rogat. Sund.	8 A 48	0 A 45	
15	4	M	Quind. Pasch. 4 Return.	9 51	1 47	
16	5	Tu	Days increas'd 8 ho. and a quar	10 44	2 50	
17	6	W	Rogat. W. ☉. John Ev. a p. L.	11 26	3 50	
18	7	Th	Holy Thursd. CHRIST's Ascens.	1 59	4 46	
19	8	F	Crast. Ascen. 5 Return.	Morn.	5 38	
20	9	S	☉ due E. 7 Morn. Alt. 25° 28'.	0 27	6 26	
21	10	D	6 Sun. after Easter, Exaudi.	0 49	7 14	
22	11	M	Easter Term ends.	1 12	8 0	
23	12	Tu	*This Month (if the Weather be fine)*	1 34	8 46	
24	13	W	No real Night, but all Twilight.	1 56	9 32	
25	14	Th	Day 16 ho. Night 8 hours long.	2 21	10 19	
26	15	F	*is allowed, by the nicest and*	2 49	11 7	
27	16	S	Days incr. and Ni. shor. 8 h. 50'	3 22	11 53	
28	17	D	Whit Sund. Desc. of H. Ghost.	☽ Rises	Morn.	
29	18	M	Whit Monday. [Cant.	9 A 24	0 43	
30	19	Tu	Whit Tuesday Dunstan Archb.	10 5	1 30	
31	20	W	Ember Week.	10 37	2 19	
Ju	21	Th	*best Judges to be the best* (Weather)	11 5	3 5	
2	22	F	*in all the Year provided we have*	11 29	3 50	
3	23	S	*Cool Breezes of Wind, with*	11 52	4 34	
4	24	D	Trin. Sund. Pr. of WALES born	Morn.	5 19	
5	25	M	Cras. Trin. 1 Ret. Trin. Coll.	0 12	6 3	
6	26	Tu	Aug. first Archb. Cant. [Elec.	0 35	6 50	
7	27	W	Venerable Bede, Pr.	0 57	7 37	
8	28	Th	*fine refreshing Showers*, &c.	1 22	8 27	
9	29	F	K. CHAR. II Bir. and Ret. T. beg.	1 53	9 21	
10	30	S	Prs. AMEL. and CAROL. born.	2 32	10 20	
11	31	D	1 Sunday after Trinity.	3 21	11 22	

M D	☉ Rises	☉ Sets	♄ Rises	♃ Sets	♂ Sets	♀ Rises	♀ Sets	W. flow
1	4 16	7 45	10 A 21	9 A 54	11 A 34	3 M 36	9 A 31	4 0
6	4 8	7 53	10 1	9 39	11 26	3 37	9 2	4 [illegible]
11	4 1	8 [illegible]	9 39	9 23	11 18	3 18	8 22	3 [illegible]
16	3 54	8 7	9 18	9 12	11 8	3 1	Rises.	3 14
21	3 47	8 14	8 55	8 57	10 59	3 1	1 M 48	2 20
26	3 45	8 16	8 32	8 43	10 49	2 54	3 28	1 0

JUNE hath xxx Days.

New Moon 1 Day 17 min. past 1 in the Morn.
First Quarter 7 Day 26 min. past 5 in the Even.
Full Moon 15 Day 55 min. past 5 in the Aftern.
Last Quarter 23 Day 5 min. past 4 in the Even.
New Moon 30 Day 7 min. past 8 in the Morn.

M D	Moon's place
1	27 ♊ 58
6	12 ♋ 13
11	14 ♌ 52
16	14 ♍ 12
21	24 ♐ 47
26	11 ♑ 39

| | | |

JULY hath xxxi Days.

M	D	Moon's place
	1	6♌45
	6	16♎45
	11	27♐36
	16	27♒14
	21	20♈28
	26	9♉39

First Quarter 7 Day 2 min. before 5 in the Morn.
Full Moon 15 Day 39 min. past 8 in the Morn.
Last Quarter 23 Day 19 m. before 1 in the Morn.
New Moon 29 Day 12 min. past 3 in the Aftern.

NS	OS							
12	1	W	*Thunder, Rain, Wind (or else).*	8	A.24	1	A.	6
13	2	Th	Visit. of the B. V. Mary.	8	46	2		1
14	3	F	*Fair, Pleasant, Calm, or otherwise.*	9	11	2		53
15	4	S	Transl. of S. Mart. B. and C.	9	37	3		44
16	5	D	6 Sunday after Trinity.	9	58	4		31
17	6	M	*just what God sends us is the best*	10	22	5		18
18	7	Tu	**Tho. a Becket.** [*Weather*	10	48	6		5
19	8	W	*for Gentlemen-Farmers, Travellers,*	11	17	6		52
20	9	Th	*but (by the By.) any, nay the worst*	11	51	7		39
21	10	F	*sort, is good enough for Gamesters,*	Morn.		8		27
22	11	S	Pr. CARO. MATILDA born.	0	33	9		15
23	12	D	7 Sunday after Trinity.	1	20	10		3
24	13	M	Now beg. to be real Night, Sun at	2	14	10		57
25	14	Tu	Midni. being more than 18 Deg.	3	14	11		37
26	15	W	**Swithin** B. of Winch. Transl.	☽ Rises		Morn.		
27	16	Th	☉ Amp. at rising and setting 33°	7	A55	0		23
28	17	F	10′ below the Horizon.	8	18	1		8
29	18	S	Days shorten'd 1 hour 8 min.	8	38	1		52
30	19	D	8 Sunday after Trinity. [Ant.	9	0	2		36
31	20	M	Dog-days begin. **Marg.** V and M	9	21	3		22
A	21	Tu	Days 15 ho. and an half long.	9	49	4		7
2	22	W	**St. Mary Magdalene.**	10	21	4		58
3	23	Th	☉ due East 6h. 55 m. Alt. 22° 4′	10	59	5		51
4	24	F	**Magdalen College** Election.	11	44	6		46
5	25	S	St. JAMES Ap. and M. [Moth.	Morn.		7		44
6	26	D	9 Sunday after Trin. **St. Ann.**	0	41	8		44
7	27	M	*Now, and to the End, Fine*	1	51	9		45
8	28	Tu	*Weather for the Harvest, except*	3	15	10		47
9	29	W	*some letting Showers.*	☽ Sets		11		47
10	30	Th	Days are decreased, and Nights	7	A12	0	A	40
11	31	F	lengthen'd 1 h. 54′ Pr. AUGUS. b	7	38	1		32

M	D	☉ Rises	☉ Sets	☽ Sets	♃ Rises	♂ Sets	♀ Rises	☿ Rises	W. fast.
	1	3 50	8 11	1 M 40	2 M 14	9 A 19	2 M 56	2 M 57	5′ 0′
	6	3 55	8 6	1 19	1 59	9 4	3 6	3 32	5 33
	11	4 2	7 58	0 58	1 45	8 50	3 18	Sets.	5 49
	16	4 9	7 50	0 38	1 29	8 37	3 30	8 A 23	5 50
	21	4 17	7 42	0 18	1 14	8 24	3 46	8 21	5 35
	26	4 27	7 32	11 A 54	1 0	8 10	4 1	8 14	5 12

AUGUST hath xxxi Days.

First Quarter 5 Day 37 min. past 7 at Night.
Full Moon 13 Day 3 min. past 11 at Night.
Last Quarter 21 Day 19 min. past 7 in the Morn.
New Moon 28 Day 57 m. before 1 in the Morn

M D	Moon's place
1	28 ♍ 26
6	2 ♎ 16
11	1 ♏ 50
16	4 ♑ 22
21	11 ♒ 49
26	23 ♌ 58

NS	OS			☉ Rises	☉ Sets	☽ Sets	4 Rises	♂ Sets	♀ Rises	♄ Sets	Wist.
12	1	S	Lammas Day.	8 A 2	2 A 23						
13	2		10 Sunday after Trinity.	8 28	3 12						
14	3	M	*Foggy close and sultry,*	8 53	4 1						
15	4	Tu	*follow'd with Thunder.*	9 23	4 49						
16	5	W	Days 14 hours 27 min. long.	9 56	5 37						
17	6	Th	Transfig. of our Lord.	10 34	6 25						
18	7	F	Name of *Jesus.* [10 minutes.	11 20	7 14						
19	8	S	☉ due E. 6h. 36m. Alt. 15 deg.	Morn.	8 3						
20	9	D	11 Sunday after Trinity.	0 12	8 50						
21	10	M	St. Laur. Arch. D. of R. & M	1 8	9 37						
22	11	Tu	Days are now decreas'd, and	2 10	10 22						
23	12	W	Nights lengthen'd 2h. 40 min.	3 14	11 7						
24	13	Th	Day 14 hours 5 min. long.	☽ Rises	11 58						
25	14	F	*Now pretty favourable*	6 A 48	Morn.						
26	15	S	*for the Harvest.*	7 11	0 38						
27	16	D	12 Sunday after Trinity.	7 33	1 24						
28	17	M	☉ Amplitude 16 deg. 5 min.	7 59	2 11						
29	18	Tu	☉ due E 6 h. 31 m. Alt. 12°. 27.	8 29	3 0						
30	19	W	*Still, and to the End expect*	9 4	3 51						
31	20	Th	*good Weather for the Harvest.*	9 46	4 46						
S	21	F	Day 13 ho. 53 min. long.	10 37	5 42						
2	22	S	☽ Amplitude North 13°. 6'.	11 41	6 40						
3	23	D	13 Sunday after Trinity.	Morn.	7 39						
4	24	M	St. Bartholomew Ap. & M.	0 54	8 38						
5	25	Tu	Days decreased, and Nights now	2 12	9 36						
6	26	W	lengthened 3 ho. and 27 min.	3 30	10 30						
7	27	Th	Dog-Days end.	4 50	11 23						
8	28	F	S. Au. B. of Hip. C. D.	☽ Sets	0 A 17						
9	29	S	Beheading of John Bap.	6 A 35	1 8						
10	30	D	14 Sunday after Trinity.	7 2	1 58						
11	31	M	Day 12 ho. 3 quarters long.	7 30	2 47						

M D	☉ Rises	☉ Sets	☽ Sets	4 Rises	♂ Sets	♀ Rises	♄ Sets	Wist.
1	4 33	7 2[illegible]	11 A 31	0 M 41	7 A 52	4 M 22	8 A 5	4 0
6	4 46	7 1[illegible]	11 12	0 28	7 39	Sets	7 52	3 33
11	4 57	7 [illegible]	10 54	0 14	7 26	7 A 15	7 4[illegible]	2 10
16	5 7	6 5[illegible]	10 34	0 0	7 12	7	7 7	2[illegible] 40
21	5 15	6 44	10 16	11 42	7 [illegible]	7	0 7	1[illegible] Slow.
26	5 28	6 3[illegible]	9 5[illegible]	11 27	6 47	6	51 6	5[illegible] 2 20

SEPTEMBER hath xix Days.

M D	Moon's place
First Quarter 15 Day 29 min. past 1 Afternoon.	1 15♏48
Full Moon 23 Day 34 min past Noon.	16 4♑10
Last Quarter 30 Day 16 min. past 1 Afternoon.	21 4♓46
	26 10♉55

NS	OS			☽ Rises	☽ Sets
12	1	Tu	Giles Abbot and Conf.	8 A 3	3 A 37
13	2	W	LONDON burnt A. D. 1666.	8 40	4 26
14		Th	Holy Cross Day.	9 A 23	5 15
15		F	☉ due E. 6h. 11 m. Alt. 4°. 37	10 12	6 3
16		S	*Snow'ry, but perhaps*	11 6	6 51
17		A	15 Sunday after Trinity.	Morn.	7 37
18		M	*not very much downfal*	0 5	8 26
19		Tu	*about this Time.*	1 12	9 12
20		W	Ember Week.	2 18	9 58
21		Th	S. MAT. Ap. Ev. & M. ☉ in ♎ 12	3 26	10 42
22		F	Eq. Day & Ni. m. past 5 Aft.	4 35	11 28
23		S	*in all the Habitable Parts of the*	☽ Rises	Morn.
24		A	16 Sunday after Trinity *Earth.*	6 A 13	0 16
25		M	*Fair and pleasant* [Mar	6 42	1 5
26		Tu	S. Cyprian Arch. of Carth. &	7 16	1 57
27		W	*with brisk Winds, &c.*	7 56	2 51
28		Th	*to the End of this Month.*	8 44	3 47
29		F	S. MICHAEL, and all Angels.	9 44	4 44
30		S	S. Jer. Pr. Conf. and Doct.	10 52	5 43

Here the Old Style ends, and the New takes place.

The Days to be numbred in the same Order, and the Movable Feasts to be ascertained (as usual) until the 2 *Sep.* 1752 inclusive; and the Day following to be accounted 14 *Sept.* omitting for that Time the intermediate 11 Nominal Days. All Writings after 1 *Jan.* 1752, to be dated according to the New Style. The Feasts and Fasts &c. of the Church to be observed after the said 2 *Sept.* according to the New Calendar, &c. See the late Act of Parliament for regulating the Commencement of the Year; and for correcting the Old Calendar, &c.

M D	☉ Rise	☉ Sets	♄ Sets	♅ Rises	♂ Sets	♀ Sets	☿ Sets	W. slow.
1	5 36	6 33	9 A 37	11 A 10	6 A 32	6 A 40	6 A 30	3 54
2	5 38	6 21	9 33	11 7	6 29	6 38	6 26	4 3
14	5 4[illegible]	6 1[illegible]	9 30	11 4	6 26	6 36	6 22	4 38
15	5 44	6 1[illegible]	9 26	11 1	6 24	6 34	6 19	5 0
20	5 5[illegible]	5 [illegible]1	9 10	10 47	Rises	6 2[illegible]	5 57	7 13
25	6 6	5 5[illegible]	8 53	10 32	5 M54	6 17	Rises	7 53

OCTOBER hath xxxi Days.

New Moon 7 Day half an hour before Noon.
First Quarter 15 Day 15 m. past 9 in the Morn.
Full Moon 23 Day 14 min. past 1 in the Morn.
Last Quarter 29 Day 16 min. past 8 at Night.

M D	Moon's place
1	20♋58
6	1♌21
11	6♌ 1
16	5♎47
21	8♈53
26	19♊ 3

			Morn.		6	M	41
1	A	17 Sunday after Trinity.					
2	M	☽ Amplitude 6°. 49′ South.	0	6	3		37
3	Tu	Days decreas'd, and Nights are	1	22	8		31
4	W	now lengthened 5 hours 36 min.	2	42	9		24
5	Th	*Show'ry with Wind*,	4	0	10		15
6	F	Faith. Virgin and Mart.	5	11	11		4
7	S	*or (perhaps) Fair and Calm*,	☽	Sets	11		54
8	A	18 Sunday after Trinity.	5	A 37	0	A	45
9	M	St. Denys Areop. B. and M.	6	8	1		35
10	Tu	Day 10 ho. 46 min. long. Old Mic	6	44	2		25
11	W	*however now, or soon,* [Day.	7	26	3		15
12	Th	*we may reasonably*	8	14	4		4
13	F	Transl. of K. Ed. Conf.	9	8	4		54
14	S	☉ Amplitude 14°. 39′ South.	10	6	5		42
15	A	19 Sunday after Trinity.	11	7	6		28
16	M	Days decreas'd 6 ho. 25 minutes.	Morn.		7		13
17	Tu	Etheldred, Virg.	0	11	7		57
18	W	St. LUKE the Evangelist.	1	15	8		42
19	Th	*begin to expect Frosty Mornings*	2	22	9		27
20	F	Tres. Mich 1. Return.	3	33	10		14
21	S	*and such like Notices of*	4	44	11		3
22	A	20 Sund. aft. Trin. K. G. II. Crown'd	5	58	11		54
23	M		☽	Rises	Morn.		
24	Tu	Days 9 ho. 53 min. long.	5	A 59	0		48
25	W	Crispin Mart.	6	47	1		44
26	Th	☉ Amplitude 24°. 28′ South.	7	42	2		43
27	F	Mens. Mich. 2 Return.	8	48	3		42
28	S	St. SIMON and St. JUDE Ap. & M	10	2	4		40
29	A	21 Sunday after Trinity.	11	24	5		38
30	M	Days 9 h. 28 min. long.	Morn.		6		33
31	Tu	*the approach of Winter.*	0	34	7		25

M	D	☽ Rises	☉ Set	♄ Sets	♃ Rises	♂ Rises	♀ Sets	☿ Rises	W. slow.
1	☽	13	5 46	8 A 32	10 A 14	5 M 55	6 A 6	5 M 24	9 20
6	☽	25	5 34	8 14	9 58	5 54	5 57	4 53	11 13
11	☽	38	5 21	7 58	9 42	5 56	5 50	4 51	13 19
16	☽	48	5 11	7 41	9 2[illegible]	5 55	5 41	5 2	14 36
21	☽	0	5 0	7 23	9 [illegible]	5 57	5 33	5 28	15 39
26	☽	13	4 46	7 [illegible]	8 4[illegible]	5 56	5 28	5 2[illegible]	16 8

NOVEMBER hath xxx Days.

New Moon 6 Day 6 min. before 2 in the Morn.
First Quarter 14 Day 29 min. past 5 in the Morn.
Full Moon 21 Day at 1 in the Afternoon.
Last Quarter 28 Day 40 min. past 4 in the Morn.

M. D.	Moon's place
1	23♓49
6	19♈23
11	19♉56
16	20♊32
21	29♋ 0
26	12♌39

1	W	All Saints Day.	☽	1 M49	8	M15
2	Th	Prs. of ORANGE born.		3 5	9	5
3	F	Craft. Anim. 3 Returns.		4 20	9	54
4	S	*Now, or in a few Weeks*		5 32	10	42
5	A	22 S. aft. Trin. Papists Conspira-		6 41	11	29
6	M	Term begins. ☉eclips'd invisi.	☽	Sets	0	A19
7	Tu	Day 9 hours 19 minutes long.		5 A24	1	10
8	W	*we may reasonably expect*		6 9	2	0
9	Th	*to have Winter upon us in*		6 59	2	48
10	F	King George II. born. 1683.		7 53	3	35
11	S	**St. Martin Bish. and Conf.**		8 54	4	22
12	A	23 Sunday after Trinity.		9 57	5	7
13	M	**Britius Bish.** Craft. M. 4 Return.		11 1	5	51
14	Tu	*good earnest*, (viz.) *Wind, Rain,*		Morn.	6	35
15	W	**Mathurus Bishop.**		0 6	7	19
16	Th	*Sleets, Snow, Frosts, Cold,*		1 13	8	4
17	F	**Hugh, Bish. of Linc.**		2 22	8	50
18	S	Day 8 hours 16 minutes long.		3 33	9	39
19	A	24 Sunday after Trinity.		4 46	10	32
20	M	**Edm. K. and Mart.** Oct. M. 5 Ret.		6 2	11	27
21	Tu	☉ Amp. 34°. 49 South. (Day	☽	Rises	Morn.	
22	W	**Cecilia, V. and M.** Old Martin.		5 A25	0	25
23	Th	**St. Clem. I. B. of R. and M.**		6 32	1	25
24	F	*or such like, to make good fires agreeable.*		7 43	2	28
25	S	P. WILL. HEN. born **Cath. V. M.**		8 59	3	27
26	A	25 Sunday after Trinity.		10 17	4	23
27	M	Quin. Mart. 6 Return.		11 33	5	17
28	Tu	Michaelmas Term ends.		Morn.	6	7
29	W	Day 7 hours and 3 qu. long.		0 49	6	56
30	Th	St. AND. Ap. Prs. Dow. of W. bo		2 2	7	44

M. D.	☉ Rises	☉ Sets	☽ Set	♃ Rises	♂ Rise	♀ Sets	☿ Rise	W. flow.
1	7 20	4 39	6A 44	8 A 27	5 M57	5 A 22	6 M 35	16 12
6	7 26	4 33	6 26	8 6	5 57	5 17	7 10	15 14
11	7 39	4 20	6 8	7 45	5 57	5 15	Sets	14 35
16	7 50	4 10	5 51	7 24	5 56	5 15	4 A 33	13 10
21	8 0	4 0	5 32	7 1	5 55	5 17	4 10	11 9
26	8 7	3 52	5 1.	6 38	5 54	5 19	4 7	8 40

DECEMBER hath xxxi Days.

M D	Moon's place
1	20 ♎ 34
6	22 ♐ 31
11	21 ♒ 58
16	24 ♈ 35
21	6 ♉ 58
26	20 ♊ 45

New Moon the 5 Day 13 min. past 7 at Night.
First Quarter 14 Day 39 min. before 1 Morning
Full Moon 21 Day 54 min. before 1 Morning.
Last Quarter 27 Day 3 min. before 4 Afternoon.

1	F	Days are now decreas'd, and	3	M 13	8	M 31
2	S	Nights increas'd 9 h. and a quarter.	4	23	9	18
3	A	Advent Sunday.	5	30	10	6
4	M	Marriage goes out.	6	34	10	55
5	Tu	*Frosty Mornings,*	☽ Sets		11	44
6	W	Nicol. Bish. of Myra in Licia.	4	A 44	0	A 35
7	Th	*but not very unpleasant,*	5	38	1	23
8	F	Concept. of the B. V. M.	6	35	2	9
9	S	*the Season considered.*	7	37	2	55
10	A	2 Sunday in Advent.	8	39	3	38
11	M	*Now expect plenty of Snow*	9	44	4	21
12	Tu	*or Cold Rain.*	10	48	5	3
13	W	Lucy Virgin and Mart.	11	55	5	47
14	Th	Day 7 hours 28 minutes long.	Morn.		6	31
15	F	*Not much Alteration for the present.*	1	2	7	17
16	S	℣ Sapientia.	2	12	8	6
17	A	3 Sunday in Advent.	3	24	8	59
18	M	Q. of Denmark born.	4	38	9	55
19	Tu	Greatest decrease of Days at Not-	5	49	10	53
20	W	Ember Week [tingham 9h. 25m.	6	55	11	57
21	Th	St. Thomas Apostle and Martyr.	☽ Rises		Morn.	
22	F	☉ in ♑ 56 min. past 11 Morn.	6	A 25	0	58
23	S	Greatest Dec. of Days at Lond. 8h.	7	45	1	58
24	A	4 Sunday in Advent. [50m.	9	4	2	55
25	M	Christmas Day.	10	23	3	49
26	Tu	St. Stephen I. Martyr.	11	38	4	40
27	W	St. John Ap. and Evangelist.	Morn.		5	30
28	Th	Innocents Day. or Herod's Murd. Inf	0	50	6	18
29	F	*Christmas Weather all this Week.*	2	0	7	3
30	S	Days increas'd 6 min. [ter. ♑.	3	9	7	51
31		1 Sunday after Christmas. Silve-	4	15	8	4

M	D	☽ Rises	☉ Sets	☿ Sets	♃ Rises	♄ Rises	♀ Sets	♂ Sets	♅ Rises
	1	3 13	3 47	4 A 50	6 A 14	5 M 51	5 25	4 A 10	8 50
	6	3 18	3 42	4 35	5 50	5 59	5 33	4 17	6 8
	11	3 21	3 39	4 14	5 25	5 4	5 44	4 29	3 15
	16	3 21	3 30	3 54	5 0	5 46	5 56	4 4	0 12
	21	3 21	3 30	Rises	4 36	5 44	6 9	5 2	Fall 30
	26	3 19	3 32	7 M 41	4 9	5 42	6 22	5 14	5 37

A TABLE of all the Kings and Queens of *England* since the Conquest.

The Year of the Birth of each King and Queen; also the Year, Month, and Day, whereon they began to reign: beginning the Year the first Day of January, 1752.			The Length of each Reign.			The Years expired since each Reign began and ended.	
Names.	Born.	Began to Reign.	Y.	M.	D.	Beg	End
William Conq.	1027	1066 October 14	20	10	26	686	665
William Rufus	1057	1087 Septem. 9	12	10	24	665	652
Henry I.	1058	1100 Auguſt 2	35	4	0	652	617
Stephen	1105	1135 Decem. 1	18	10	24	617	598
Henry II.	1134	1154 October 25	34	8	11	598	563
Richard I.	1156	1189 July 6	9	9	0	563	553
John	1166	1199 April 6	17	6	12	553	536
Henry III.	1207	1216 October 19	56	1	0	536	480
Edward I.	1239	1272 Novem. 16	34	7	21	480	445
Edward II.	1284	1307 July 7	19	6	13	445	425
Edward III.	1312	1327 January 20	50	5	1	425	375
Richard II.	1366	1377 June 21	22	3	8	375	353
Henry IV.	1367	1399 Septem. 29	13	5	21	353	339
Henry V.	1389	1413 March 20	9	5	11	339	330
Henry VI.	1421	1422 Auguſt 31	38	6	4	330	291
Edward IV.	1442	1461 March 4	22	1	5	291	269
Edward V.	1471	1483 April 9	0	2	13	269	269
Richard III.	1443	1483 June 22	2	2	0	269	267
Henry VII.	1457	1485 Auguſt 22	23	8	0	267	243
Henry VIII.	1492	1509 April 22	37	9	6	243	205
Edward VI.	1537	1547 January 28	6	5	8	205	199
Mary I.	1516	1553 July 6	5	4	11	199	194
Elizabeth	1533	1558 Novem. 17	44	4	7	194	149
James I.	1566	1603 March 24	22	0	3	149	127
Charles I.	1600	1625 March 27	23	10	3	127	103
Charles II.	1630	1649 January 30	36	0	7	103	67
James II.	1633	1685 February 6	4	0	7	67	63
Mary II.	1662	1689 Feb. 13	5	10	15	63	58
William III	1650		13	0	23	63	50
Anne	1665	1702 March 8	12	4	24	50	38
George I.	1660	1714 Auguſt 1	12	10	10	38	25
George II.	1683	1727 June 11	whom God preſerve.				

A Compendious TABLE of INTEREST,

Shewing the Intereſt of any Sum of Money, from a Million to a Pound; for any Number of Days, at any Rate of Intereſt.

N°.	l.	s.	d.	q.	N°.	l.	s.	d.	q.
1000000	2739	14	6	0 ,99	1000	2	14	9	2 ,14
900000	2465	15	0	3 ,29	900	2	9	3	3 ,12
800000	2191	15	7	1 ,59	800	2	3	10	0 ,11
700000	1917	16	1	3 ,89	700	1	18	4	1 ,10
600000	1643	16	8	2 ,19	600	1	12	10	2 ,80
500000	1369	17	3	0 ,49	500	1	7	5	3 ,70
400000	1095	17	9	2 ,79	400	1	1	11	0 ,50
300000	821	18	4	1 ,09	300	0	16	5	1 ,40
200000	547	18	10	3 ,40	200	0	10	11	2 ,30
100000	273	19	5	1 ,70	100	0	5	5	3 ,01
90000	246	11	6	0 ,32	90	0	4	11	0 ,71
80000	219	3	6	0 ,96	80	0	4	4	2 ,41
70000	191	15	7	1 ,59	70	0	3	10	0 ,11
60000	164	7	8	0 ,22	60	0	3	3	1 ,81
50000	136	19	8	2 ,85	50	0	2	8	3 ,51
40000	109	11	9	1 ,48	40	0	2	2	1 ,21
30000	84	3	10	0 ,11	30	0	1	7	0 ,90
20000	54	15	10	2 ,74	20	0	1	1	2 ,60
10000	27	7	11	1 ,37	10	0	0	6	2 ,30
9000	24	13	1	3 ,23	9	0	0	5	3 ,67
8000	21	18	4	1 ,10	8	0	0	5	1 ,40
7000	19	3	6	2 ,96	7	0	0	4	2 ,41
6000	16	8	9	0 ,82	6	0	0	3	3 ,76
5000	13	13	11	2 ,58	5	0	0	3	1 ,15
4000	10	19	2	0 ,55	4	0	0	2	2 ,52
3000	8	4	4	2 ,41	3	0	0	1	3 ,80
2000	5	9	7	0 ,27	2	0	0	1	1 ,26
1000	2	14	9	2 ,14	1	0	0	0	2 ,63

RULE.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two laſt Figures to the right Hand, and the reſt you muſt find in the Table.

Example, What is the Intereſt of 100 l. for 365 Days at 5 per Cent

N°. of Days 365
multiply by 100
Product 36500
multiply by 5 Rate p. Cent.
825100

Then in the Table
againſt 1000 is 2 14 9 2 ,14
800 2 3 10 0 ,11
20 0 1 1 0 ,60
5 0 0 3 1 ,15
Anſw. 5 0 00 ,00

A List of the Twenty-seven Bishops in *England*, &c.

Dr. Thomas Herring, Archbishop of Canterbury.
Dr. Matthew Hutton, Archbishop of York.
Dr. Tho. Sherlock, London.
Dr. Joseph Butler, Durham.
Dr. Benj. Hoadley, Winchester.
Dr. Joseph Wilcox, Rochester.
Dr. Fr. Cornwallis, Litch. & Co.
Dr. John Thomas, Peterboro.
Dr. Sam. Peploe, Chester.
Dr. John Gilbert, Sarum.
Dr. Geo. Lavington, Exeter.
Dr. Tho. Gooch, Ely.
Dr. Rich. Osbaldiston, Carliſle.
Dr. Martin Benson, Glocester.
Dr. Tho. Secker, Oxford.
Dr. Isaac Maddox, Worcester.
Dr. Tho. Hayter, Norwich.
Dr. John Conybear, Briſtol.
Dr. Mathias Mawſon, Chicheſt.
Dr. Edw. Creſſet, Landaff.
Dr. Edw. Willes, Bath and Wells.
Dr. Zach. Pearſe, Bangor.
Dr. John Thomas, Lincoln.
Dr. Rob. Drummond, St Aſaph.
Dr. Rich. Trevor, St Davids.
Dr. James Beauclerc, Hereford.
Dr. Wilſon, Sodor and Man.

Dr. Hugh Thomas, Archdeacon of Nottingham.
Dr. Scrope Berdmore Official.
Mr. Thomas Bennett, Regiſter.

The Names of the Learned Judges in the Courts of Law at *Weſtminſter*.

1. In the Chancery.

Philip Lord Hardwick, L. H. Chancellor of Great Britain.
Sir John Strange, Maſter of the Rolls.

2. In the King's Bench.

Sir William Lee, Lord Chief Juſtice,
Sir Martin Wright, Sir Tho. Denniſon, Sir Michael Foſter.

3. In the Common Pleas.

Sir John Willes, Lord Chief Juſtice,
Sir Tho. Burnet, Sir Tho. Birch, Nath. Gundry Eſq.

4. In the Exchequer.

Sir Thomas Parker, Lord Chief Baron,
Edw. Clive, Heneage Legge, Eſqs. Sydney Stafford Smyth Kt.

Sir Dudley Ryder, Attorney General.
William Murray Eſq. Sollicitor General.

A Table of the MAYORS and SHERIFFS of *Nottingham*, beginning at *Michaelmas* 1720.

MAYORS.	SHERIFFS.
1720. Wm. Bilbie.	Wm. Robinſon Jun. Edm. Wildbore.
1721. Ben. Greene.	John Burton, Rob. Egginton Jun.
1722. Alex. Burden.	James Hoe, James Huthwaite Jun.
1723. Tho. Trigge.	Nathanael Charnells, John Hornbuckle.
1724. Marm. Pennell.	Sam. Harris, John Poe.
1725. Rich. Bearne.	John Morley, Wm. Bilbie Jun.
1726. Wm. Bilbie.	Rich. Wheldon, Roger Radforth Jun.
1727. Joſeph Walters.	John Farnill, Joſeph Ingleſant.
1728. Ben. Greene.	Jonathan Truman Jun. Hen. Butler.
1729. Alex. Burden.	John Wood, Sam. Fellows.
1730. Wm. Trigge.	Steph. Egginton, Cornelius Huthwaite.
1731. Tho. Trigge.	John Foxcroft, John Bilbie.
1732. John Huthwaite.	Tho. Langford, Leavis Sherwin.
1733. Tho. Langford.	Iſaac Wylde, Joſeph Finch.
1734. Wm. Bilbie.	Francis Parkyns, Joſeph Smith.
1735. Ben. Greene.	Joſeph Wright, Joſeph Bilbie.
1736. Alex. Burden.	James Dymock, Robert Huiſh.
1737. Wm. Trigge.	Charles Morley, James Hornbuckle.
1738. John Newton.	Tho. Shaw, Joſeph Wright.
1739. Ja. Huthwaite.	Humphrey Hollins, Sam. Wood.
1740. Tho. Langford.	Wm. Cooper, John Sherbrooke.
1741. Alex. Burden.	Alex. Burden Jun. Ben. Bull.
1742. Wm. Trigge.	James Huthwaite Jun. Robie Swann.
1743. John Hornbuckle.	William Goodwin, William Foulds.
1744. John Burton.	John Killingley Jun. Tho. Haywood.
1745. Henry Butler.	John Oldknow, John Sands.
1746. Ja. Huthwaite.	Thomas Cotes, Thomas Oldknow.
1747. Tho. Langford.	John Plumptre Jun. Eſq. Wm Cotton.
1748. Wm. Trigge.	John Egginton, Humphrey Cox.
1749. John Hornbuckle.	Benjamin Mather, Rich. Butler.
1750. John Burton.	Jona. Dodſon, Wm Seagrave TownCl.
1751.	

Wm Seagrave Gent. Town Clerk.
Tho. Cotes Gent. Town Steward.
Mr. John Blackwell, Mr. Tho. Spybie } preſent Chamberlains.

AS there's but Two Eclipſes in this Year,
They muſt be Solar; *Rules* of *Art* declare;
Then give me Leave, and I will plainly ſhew,
The Times when they will happen; as below.

The Firſt will be on *Saturday* the 2d of *May*, about 6 in the Morning; and the Second on *Monday November* 6, at 2 in the Morning. Theſe are both inviſible to us the Inhabitants of *Great Britain*, but to other Parts of the Terraqueous Globe the Firſt will be ſeen as follows:

With reſpect to the Meridian of *London*

The Eclipſe begins *May* 2, at $3^h, 6', 36''$, at which Time the Edge of the Penumbra touches the Earth's Diſk, and the Eclipſe begins to ſhew itſelf at Sun Riſing in Lat. 4° 30′ S. Long. 224° 42′ Eaſt, a little to the N. W. of *Solomon's Iſles*. At 4^h 1′ 9″ the Eclipſe is central at Sun-riſing in Lat. 3° 36′ S. Long. 148° 49′ Weſt, and is on the *Globe* N. N. W. of the *Marques Mendois Iſles*. At 5^h 2′ the Eclipſe will be central at *Mexico*, and croſs the *Bay* paſſing a little to the South of *Cape Florida*, where he will be centrally eclips'd in the Nonag. Degree at 5^h 45′, and at 5^h 55′ the Central Shade will croſs the *Iſle of Curates*, and from thence a little to the N. of the *Caribbee Iſles*. At 7^h 11′ the Sun will alſo be centrally eclipſed croſſing the *Iſles of St. James* and *Bravo*. The central Eclipſe will be laſt ſeen at Sun ſetting in Lat. 12° 5′ N. and Long. 18° 5′ W. a little to the South of the Mouth of *Niger*, having paſſed over 9144 *Miles Eaſtward*. And laſt y quits the Earth at 8^h 23′ 24″ in Lat. 12° N. and Long. 31° 44′ W. which falls on the Globe a little to the South of the *Dagarea Rocks*.

John Hollingworth.

Mr. *Abr. Lord* writes as follows:

The firſt Solar Eclipſe is *May* 2, at 5^h 19′ in the Aftern. but tho' it happens in the Day-time, it cannot be viſible here, becauſe the Moon's Lat. tho' No. is ſo ſmall, ſo that it increaſes her Parallax, and the Eclipſe can never reach our Iſlands.

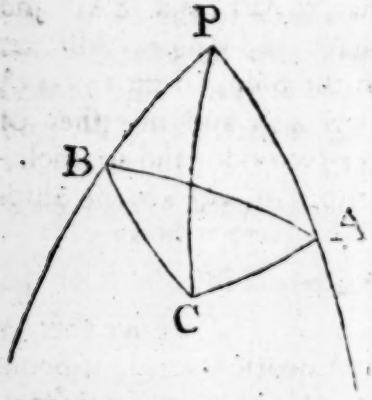
The Sun will be firſt ſeen eclipſed on his vertical Point at his Riſing in the *Great South Sea*, in Lat. 3° 20′ S. and Long. 131° 8′ Weſt of *London*: The Centre of the Penumbra firſt enters the Earth's Diſk, and the Sun is firſt ſeen centrally eclipſed at his Riſing in the ſame *vaſt Ocean* about 7° to the N. E. of *Dog Iſle* in Lat 2° 21′ N. and Long. 144° 26′ W. from whence it traverſeth North Eaſterly, and enters *Mexico* a little to the

North of *Acapulco*, and having croſs'd *Mexico* it enters the *Bay or Gulph of that Name*, which having paſſed, it enters *Florida* to the South of *Auguſtine*, where the Nonageſimal Sun will be centrally eclipſed in Lat. 25° 25′ and Long. 80° 54′ W. and the Meridional Sun will be centrally eclipſed in Lat. 25° 24′ North, and Long. 79° 48′ Weſt in the *Atlantic Ocean*, then paſſing over the *Iſles of Lucayo* and *Cygateo*, it croſſes the *main Atlantic*, the *Cape Verd Iſles*, and enters *Africa* a little to the No. of the River *Gambia*, where the Sun is laſt ſeen totally eclipſed at his ſetting in Lat. 14° 30′ N. and Long. 10° 21′ Weſt, and the whole Penumbra quits the Earth in Lat. 13° 34′ N. and Long. 24° 14′ Weſt of *London*.

The Second Eclipſe is *November* the 6th, at 2^h 4′ in the Morning, ſo not viſible here; but in *Java*, *Sumatra*, and *Borneo* it will be a very great Eclipſe.

Anſwers to the Mathematical Queſtions in 1751.

(1) Queſt. 101 anſwer'd by Mr. *John Wiggleſworth*.



LEt P repreſent the North Pole, A and B the Ports ſailed from, and C the Place of their meeting. Then in the oblique ſpheric Triangle ABP there is given the Sides AP and BP the Comp. of the Latitudes of the two Ports, and the included ∠APB = 20° the Diff. of Long. to find AB = 17° 15′, and the ∠s PAB = 47° 55′, and PBA = 117° 49′. But 180°—117° 49°—45° = ∠ABC = 17° 11′, and 180°—47° 55′—45° = ∠BAC = 87° 05′. Then in the oblique ſpheric Triangle ABC there is given the Angles ABC and BAC, and the included Side AB to find the Sides AC = 5° 10′, and BC = to 17° 44′. Again in the oblique ſpheric Triangle CBP there is given the Sides CB and BP, and the included Angle CBP, to find the Side PC the Comp. of the Latitude arriv'd in. Hence the Diſtance ſailed from the Port B is 1064 Miles, and from A 310 Miles, and the Latitude where they met is 36° 14′ North.

Mr.

Mr. *Wm Bevil*, Writing-maſter and Teacher of *Mathematics* at *Harpſwell* near *Gainſborough*, ſolves it in the following manner:

Let p and $-p$ = the Sine and Coſine of the Angles CBP and CAP, a and b the Sine and Coſine of AP, and b and a the Sine and Coſine of BP, n, and the Sine and Coſine of the Angle BPA the Diff. of Long. x and y the Sine and Coſine of the Angle CPB, then will $ny - mx$, and $my + nx$ be the Sine and Coſine of the Angle CPA, and *per Spherics* $\frac{ap}{pbmy + pbnx - pny + pnx} = \frac{bp}{apy - px}$ the Tangent of CP; and by Reduction $\frac{a^2 - b^2m + bn}{b^2n + bn + a} = \frac{x}{y} = ,2768407 =$ Tang. of 15° 29′ = the Angle CPB, and CP the Comp. of Lat. = 53° 46′. Hence the Latitude is 36° 14′.

The ſame Queſt. may be anſwer'd without *Algebra*, thus:

In the Triangle ABP there is given BP and AP, the Complements of the two Latitudes the Ships ſail'd from the Angle P, the Diff. of Long. from which AB is found 17° 15′, and the Angles ABP = 117° 49′, BAP = 47° 55′; now if 45° be added to each of the Angles, that is ABP and BAP and each Sum taken from 180°, we have the Angles ABC = 17° 11′, and BAC = 87° 05′ with the Side AB = 17° 15′, AC will be found 5° 10′, and BC 17° 44′, and in either of the Triangles CBP and CAP we have two ſides and an included Angle given, to find CP the Comp. Lat. 53° 46′ the Ships met in. Hence the Lat. is 36° 14′ the ſame as before.

The ſame anſwer'd by *Harland Wid.*

I cannot conceive why it ſhould be required to ſolve this by a ſimple Equation, or indeed by any Equation at all, it being (if I do not miſapprehend it) nothing more than a common Problem in Great Circle Sailing; for in the oblique angled Spherical Triangle PBA are given PB = 40° = Comp. Lat. of the firſt Ship, the Side PA = 50° = Co. Lat. of the 2d Ship, and the Angle BPA = 20° = Diff. of Long. by which the Side BA is found = 17° 14′, the Angle BAP = 47° 54′, and the Angle ABP = 117° 50′. Now the Angle CBP *minus* the Angle ABP = the Angle CBA = 17° 10, and the Angle CAP *minus* the Angle BAP = the Angle BAC = 87° 06′, whence in the Triangle CBA having two Angles, and their contained Side BC is found 17° 45′, or 1065 Miles = Diſt. ſail'd by the

firſt Ship; and the Side AC = 5° 10′ or 310 Miles = Diſt. ſail'd by the 2d Ship. Again in the Triangle CBP are given two Sides and their contained Angle whence the third Sine CP is found = 53° 46′. Conſequently the Place of their Meeting was in Latitude 36° 14′ North. *Q. E. I.*

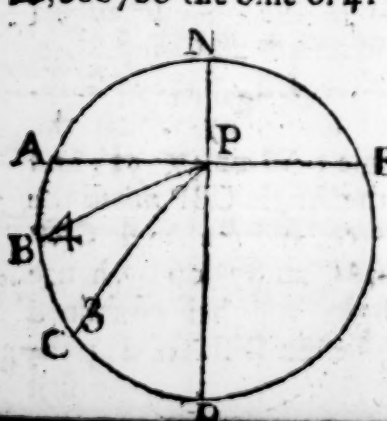
We received very elegant Solutions to this Queſtion from our ingenious Correſpondents Mr. Joſeph Orchard, *Mr.* Steph. Hartley, *Mr.* Abr. Lord, *Mr.* Richard Gibbons, *Mr.* Lhewellin Davies, *Mr.* Benj. Donn, *Mr.* Tho. Moſs, *Mr.* Cha. Smith, *Mr.* James Collingridge, *Mr.* William Eneſer, *Mr.* Tho. Garrard, *Mr.* William Spicer, *Mr.* William Kingſtone, *Mr.* Sam. Bamfield, *and* Rimſide: *But Room would not admit the Inſertion of them at large, which we hope they will generouſly excuſe.*

(2) Queſt. 102 anſwer'd by Mr *Roger Widger*.

'Tis evident that on all Horizontal Dials, the Tang. of the Hour Diſtance on the Plane is equal to the Sine of the Latitude of the Place any where taken. Put x = the Sine of the Lat. of the Place, t = the Tang. of 60°, and T = the Tang. of 82° 48′; Then as $1 : x :: t : xt$ = Tang. of the given Arch 82° 48′, and $\frac{1+xt}{1-xt}$ = T, Redd x = ,66666 the Nat. Sine of 41° 48′ nearly.

The ſame anſwered by Mr *Joſeph Orchard*.

Let t = Tang. of 82° 48′ the given Sum of the Diſtance or Angles, m and n the Tangents of 45° and 60°, the Degrees in the Hours from 12; x = the Sine of the Latitude and Radius = 1, Then it will be $1 : x :: m : mx$ the Tangent of the Diſt. of the 3 o' Clock Line, and $1 : x :: n : nx$ the Tangent of the Diſtance of the 4 o' Clock Line from the Meridian Lines; and the Tang. of their Sum is $\frac{\overline{m+n} \times x}{1-mnx^2} = t$ *per* Queſt. ∴ $tmnx^2 + \overline{m+n} \times x = t$, and $x = \frac{\sqrt{\overline{m+n}^2 + 4tmn} - m - n}{2tmn}$ = ,666706 the Sine of 41° 48′ the Lat. req^d.



The ſame anſwer'd by Mr. *Steph. Hartley*.

Let AD repreſent Part of the Horizon, P the North Pole, AB the Arch from Six, BC that from 4 to 3, and CD that from 3 to 12, or Noon. Let a = the Tang. of 45° = Angle DPC, b = that of 60° = Angle DPB, and c = that of 82° 48 = DB + DC;

DC; and let x = the Nat. Sine of the Latitude required and Radius = 1. Then *per* Spherics ax = CD, and bx = BD, and their Sum $\frac{bx+ax}{1-abx^2} = c$, this reduc'd gives $x = ,666707$ which anſwers in the Tables of Nat. Sines to 41° 48′ 48″, the Latitude required.

The ſame anſwer'd by Mr *George Godhelp*.

Let 1 = Tangent of 45°, d = Tangent of 60°, c = Tang. of 82° 48′, Radius = 1, and x = the Nat. Sine of the required Latitude: Then $1 : x :: 1 : x$ = Tang. of the Diſtance of 3 o' Clock from the Meridian, and $1 : x :: d : dx$ = Tang. of the Angle of the 4 o' Clock with the Meridian, and the Tang. of their Sum is $\frac{xd+x}{1-dx^2} = c$, which out of Fractions and tranſpos'd, is $x^2dc+xd+x = c$. Put $d+1 = s$, and $dc = r$, then $x^2 + \frac{s}{r}x = \frac{c}{r}$; whence $x = \sqrt{\frac{c}{r} + \frac{s^2}{4r^2}} - \frac{s}{2r}$ = 0,66672, which anſwers in the Tables of Nat. Sines to 41° 48′ 51″, the Latitude required.

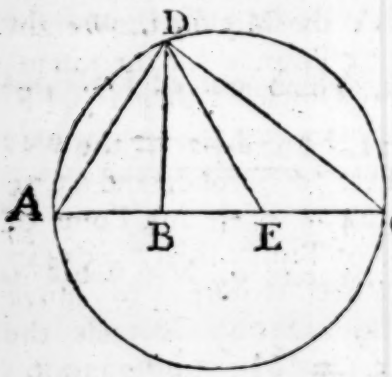
The ſame anſwer'd by Mr. *Cha. Maſon* Jun.

In the adjacent Figure let DANE repreſent the Horizon, P the Pole, DPN the Meridian; then D3 + D4 = 82° 48′ = the Diſtance of the Sum of the Hour Lines: Alſo the Angle CPD = 45°, whoſe Tangent call t; BPS = 60° Sine call a; and let m and n = Sine and Coſine of half the Sum of the Diſtances of the Hour Lines = 41° 24′; x and y = Sine and Coſine of half their Difference. Then will $my+nx$ = Sine of DB; and $my-nx$ = Sine of DC: Alſo $\frac{my-nx}{mx+nx}$ = its Tang. Then *per* Spherics $t : \frac{my-nx}{mx+nx} :: 1\ (= \text{Radius}) : \frac{my-nx}{t \times mx+nx}$ = the Sine of the Latitude. And as $a : my+nx :: 1 : \frac{my+nx}{a}$ = Sine of (the Hypothenuſe) PB; again as $1 : \frac{my+nx}{a} :: a : my+nx$ = the Sine of the Lat. Hence $my+nx = \frac{my-nx}{t \times mx+nx}$; which Equation reduc'd and ſolv'd, gives $x =$ 13413, which anſwers in the Tables of Natural Sines to 7° 42′ 30″; whence the Latitude is 41° 49′ nearly.

The ſame anſwer'd by Mr. *Tho. Moſs.*

Since it is evident (from the common Proportion made uſe of to find the Hours Diſtances) that the Tangents of the Diſtances of the Hours 1 and 11, 2 and 10, 3 and 9, *&c.* from the Meridian or 12 o' Clock Line in any given Latitude are univerſally as the Tangents of 15°, 30°, 45°, *&c.* reſpectively; Now becauſe there is given *per* Queſt. the Hours Diſtances of 3 and 4 in one Sum, we have the following Conſtruction.

Take AB to BC (ſee the following Figure) in the Ratio of the Tangent of 45° to that of 60°; upon the whole Line AC deſcribe a Segment of a Circle to contain the given Angle 82° 48′; from B erect a Perpendicular meeting the Periphery in D, join AD and DC, then will the Angles BDA and BDC expreſs the Diſtances from the Meridian, of the Hours of 3 and 4 reſpectively: To determine which make BE = AB, and join DE; then it will be as AC : EC :: Sine ADC: Sine EDC the Difference of the Angles at the Baſe. Whence the Angle BDC (the Diſtance of the Hour Line of 4 from the 12 o' Clock Line) is found; and conſequently the Angle BDA is known: Then *per* Spherics it will be as Tangent 60°: Tang. BDC (as found above) :: Rad.: the Sine of the Latitude required.



This Queſtion was alſo ſolved by Mr. John Hollingworth, Harland Widd, *Mr.* Tho. Grimes, *Mr.* Abr. Lord, *Mr.* Ralph Brockſopp, *Mr.* John Peachy, *Mr.* Richard Gibbons, *Mr.* Alex. Rowe, *Mr.* Lhewelin Davies, *Mr.* John Watchorne, *Mr.* John Wigleſworth, *Mr.* Benj. Donn, *Mr.* Cha. Smith, *Mr.* James Collingridge, *Mr.* W. Whalhead, *Mr.* Taylor, *Mr.* Sam. Bamfield, Rimſide; *and many others, whoſe Names may be ſeen in the Catalogue.*

(3) Queſt. 103 anſwer'd by Mr. *Abr. Lord*, the Propoſer.

Let the Area of the Hole be = *a*, or 5 Feet, the Height of the Water = 3 Feet = *b*, the Force of Gravity in a Second = 16,1 Feet = *c*, then by the Laws of Hydroſtatics, we have $\frac{ac}{2}\sqrt{b}$, = the Number of ſolid Feet evacuated in one Second = 6,96325 Feet of Water = 3,8091 Hundred Weight; from which ſubſtract 1,5 Hundred, and there will remain 2.3091

the

the relative Force on the Wheel, and 13.7265 Feet is the Celerity. Now for 3.8091 put a, for 2.3091 put b, for the Celerity put c, and we have $\frac{ac}{a+b}$ for the Velocity of the Wheel in a Second of Time = 8.729 Feet, by which divide the Periphery of the Wheel, and 4.582 Seconds is the Time of one Revolution of the Wheel: But while the Wheel makes one Revolution, the Stone makes 5.625 Revolutions: Therefore in an Hour the Stone makes 4419.5. Conſequeatly 552.4 Pints is the Meal ground, or 8.6374 Buſhels.

Mr. *Wm. Bevil's* Anſwer to the ſame is as follows:

1 × ,5 × 3 = 1.5 which multiply'd by 62.5 *lib.* the Weight of a cubic Foot of Water) is = 93.75 Pounds for the inſtantaneous Preſſure of the Water on any Obſtacle; then $16\frac{1}{12}$ F. : $\overline{32\frac{1}{6}}^{2}$ F. :: 3 F. : to the Square of the Velocity of the Water, which Velocity is 13.89244 Feet *per* Second, and 93,75 × 13,89244 ÷ 168 ($1\frac{1}{2}$ C) = 7.752477 Feet, any Point of the Wheel moves round in 1 Second of Time: then 7,752477 : 1 :: 40 : 5,15964 Seconds the Wheel requires to move once round, 5,15964 : 1 :: 3600 : 697.723096 : Rounds the Wheel moves in an Hour 1 : 5,625 (= $4\frac{5}{8}$) :: 697,723096 : 3924,692415 Rounds the Stone moves in one Hour, which divided by 8 gives 490.5865518 Pints, which is 7 Buſh. $2\frac{1}{2}$ Pints, and ſomething more, the Mill grinds in an Hour.

The ſame anſwered by Mr *Will. Kingſton.*

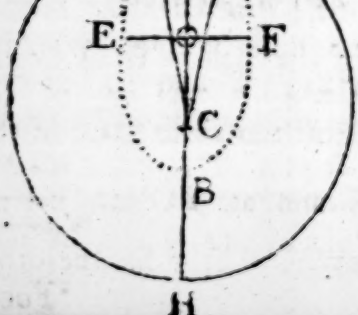
The Velocity acquired by the Fall of the Water will be the ſame as that of any other Body thro' the ſame Space: Therefore it will be as $16\frac{1}{12}$ Feet : $1^{2''}$: : 3 Feet : $\frac{36}{193}$ = Square of the Time of its Deſcent ∴ $\frac{6}{\sqrt{193}}$ = the Time, and as $\frac{6}{\sqrt{193}}$: 6 : : 1 : $\sqrt{193}$ = the uniform Velocity of the Water from the Floodgate in one Second of Time. Hence $\frac{\sqrt{193}}{2}$ = 6.44765 *cubic Feet* in one Second: Now as $62\frac{1}{2}$ *Pounds Weight* is equal to a cubical Foot of Water, the whole Weight will be 402.978125 *Pounds:* Then as 402.978125 Pounds : $1''$: : 112 *Pounds*: $0''.27793$ = the *Time* that will put the Wheel in Motion: Then as $\sqrt{193}$: $1''$: : 40 *Feet* : $2''.87795$ = the *Time* of one Revolution of the Wheel; and as $2''.87795$: 1 : : $3599''.72207$: 1250,793 Revolutions of the Wheel in one Hour;

Hour; Then as 1 : $4\frac{5}{8}$ :: 1250,793 : 7035.71625 Revolutions of the Stone. Whence the Quantity of Meal ground is 13 *Buſh.* 5 *Gall.* 3.7322 *Quarts.*

The ſame anſwer'd by Mr *Sam. Bamfield.*

Per Graveſand's Mathematical Philoſophy, p. 188. N. 378. the Time in which a Body falling freely goes thro' the Height of the Liquid above the Hole, a Column of the Liquid flows out equal in Length to twice that Height; *per* Laws of Deſcending Bodies ſay as $16\frac{1}{12}$ Feet : $1''^2$ of Time : : 3.5 Feet : $4666'' = 28''' =$ the Time a heavy Body will be deſcending thro' the Height of the Water $= 3.5$ Feet, in which Time a Column of Water 7 Feet in Height or Length, whoſe Baſe is a Parallelogram, Breadth half a Foot, and Length a Foot (the Dimenſions of the Orifice) will flow, run, or ſpout out, which Weight will be 265.838832 Pounds Troy. Then ſince the Water-wheel is 40 Feet in Circumference, and is driven by a Stream which runs 7 Feet in 28 Thirds of Time; therefore the Water-wheel will turn or move itſelf in its Periphery 7 Feet alſo in the ſame Time: Hence it will make one intire Revolution in the ſpace of 2 Seconds and 40 Thirds; and in one Hour exactly $22\frac{1}{2}$ Revolutions; Conſequently the Wheel of 45 Teeth will make the ſame Number of Revolutions in the ſame Time, becauſe on the ſame Axis; and whilſt this driving Wheel revolves once, the upright Wheel, or that which hath 8 Pinions, will revolve 5.625 Times; Therefore it will in an Hour revolve 126.5625 Times; Conſequently $126.5625 \times \frac{1}{8}$ Parts of a Pint of Meal will give 15.82 Pints of Meal ground in an Hour; which was required.

Theſe are moſt of the Solutions we have received to this Queſtion, which may be obſerved differ from the Propoſer's, as well as from each other; which of them is in the right, is left for the Curious to determine at their leiſure Hours.



(4.) Queſt. 104. anſwer'd by Mr. *Abr. Lord*, the Propoſer.

Firſt the Velocity of the Place of Projection at 14,5 Miles above the Earth's Surface is ,24022 Miles, by which if the Velocity of the Projectile, and the Directions be compounded, the abſolute Velocity of the Projectile will be 1.959 Miles at an Angle of Elevation of 26° 46′ and

and 11° 24′ from the South towards the Weſt, and the periodic Time in a Circle at that Diſtance is 1ʰ 25′ 31″, and the Velocity 4.9 Miles. Therefore the Velocity in the Trajectory is to the Velocity in a Circle as ,4052 to 1, and conſequently the Curve an Ellipſis (according to *Simpſon's Fluxions*, Art. 171. or *Colin Mac Laurin*, Art. 874.) Now if $a =$ to (the Rad. CD) 4014.5, $b =$ the Semi Conjugate, $n =$,4052, and $p =$ the Coſine of the Angle of Elevation, Rad. $= 1$; we ſhall have, by the aforeſaid Articles $\frac{a \pm a\sqrt{1 - 2n^2p^2 + p^2n^4)}}{2 - n^2}$ for the Diſtance of the two Apſides from the Focus C $=$ 4147.2 and 280.8 Miles, then the Tranſverſe is 4428, by which the Conjugate may be found $=$ 2144 Miles, and by the Property of the Ellipſe, in the Triangle DCf we have all the Sides to find the Angle DC$f =$ 5° 44′ 16″, and again the Angle MCf $=$ 6° 0′, and therefore the Angle DCM 11° 44′ 16″, and the Arch 831.8 Miles, and from the Area of the Ellipſe and Circle the periodic Time in the Ellipſis is 39′ 11″, and by meaſuring the Segment or Elliptic Sector DCM, the Time of Flight above the Earth is 10′ 23″; then by Spheric Trigonometry, the Latit. of the Place is found 40° 6′ North, and the Long. 3° Weſt; but in 10′ 9″ the Earth moves Eaſtward 2° 36′; Therefore the Longit. will be 5° 36′ Weſt of *London*, by which the Diſtance from *Tangier* may be readily found.

The ſame anſwer'd by Mr. *Thomas Moſs*.

Let HLT be a great Circle of the Earth paſſing thro' *London* and *Tangier*, and let DL be the Height of the Caſtle: Morever let DAM be the Arch of the Ellipſis deſcribed by the Ball MT the required Diſtance. Put CL $=$ CH, the Earth Radius $= a$, CD $= a + 14.5 = d$, and the Sine of the Angle CD$a = m$. Now it is known that the Velocity ſufficient to retain the Ball in a Circle whoſe Radius is CD, will be at the Rate of $26000 \times \sqrt{\frac{CL}{CD}} = 25948$ Feet *per* Second, which is to the given Velocity (10368) of the Ball at D, as 1 to 4 very near: Therefore if 4 be put $= n$, it will appear, by *Simpſon's Fluxions*, p. 261. that the Semi-tranverſe (AO) of the Ellipſis will be $\frac{d}{2 - n^2}$, and the Semi-Conjugate (EO) $= \frac{mnd}{\sqrt{2 - n^2}}$; whence AC ($=$ OC $+$ AO) is known: Let f be the other Focus

Focus of the Ellipſis: Join D*f*, and M*f*; then in the Triangle CD*f* are given all the Sides (for CD + D*f* = AB, which was found above, and CD is given) whence the Ange DC*f* may be found; and by the ſame way of Reaſoning the three Sides of the Triangle CM*f* are given, whence the Angle MC*f* may be found; therefore the Angle DCM, or the Arch LM is known, and conſequently the required Diſtance. *Q. E. I.*

Time will not permit me to give the Numerical Calculation of the above Solution, but am pretty confident there can be no Objection to the Principles upon which the ſaid Solution is founded.

This Queſtion was alſo anſwer'd by Mr. John Hollingworth, Harland Widd, *Mr.* Benj. Donn, *Mr.* William Kingſtone, *and Mr* Sam. Bamfield, *but the Room we are confined to obliges us to omit their Inſertion.*

(5) Queſt. 105 anſwer'd by Mr. *Richard Gibbons.*

Put b = the Bung Diameter, and h = the Head Diameter; Then by the Queſtion $\frac{7h}{6}$ = the Length. Hence by *Shircliff's Gauging*, p. 199. $h^3 + 2hb^2 \div 923.27 = 97,38029$ Ale Gallons; which reduc'd gives $h = 30$, and the Length = 35 Inches.

The ſame anſwer'd by Mr. *Paul Sharp.*

Put $a = 97.38029$ Ale Gallons, $b = 32.38029$ the Bung Diam. in Inches, and $7x$ = the Length ſought; then will bx = the Head Diam. *per* Queſt. Whence *per Ward*, page 444. we have this Equation (*viz.*) $14b^2x + 252x^3 = 1077,15a$, which in Numbers and reduc'd, gives $x^3 + 58,24906x = 416.24529$; ſolved $x = 5$; whence the Length = 35, and the Head Diameter 30 Inches.

The ſame anſwer'd by Mr *Tho. Ward.*

Let $32.38029 = b$, $97.38029 = c$ } x = Head Diameter, y = Length } ſought.

Then $6y = 7x$ *per Queſt.* and $\overline{2bb + xx} \times y \div 1077.15\,(d) = c$, by a well known Theorem. Whence $y = \frac{cd}{2bb + xx} = \frac{7x}{6}$; which out of Fractions is $7xxx + 14bbx = 6cd$, and reduc'd gives $x = 30$ Inches the Head Diam. and $y = 35$, the Length.

The ſame anſwer'd by Mr. *William Bevil.*

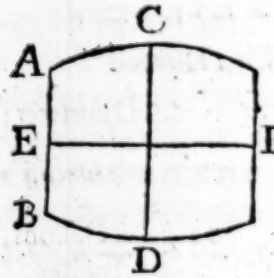
Let a = the Bung Diam. b = the Content of the Caſk in Inches, and for the Head Diam. put x; Then $\frac{7x}{6}$ = the Length, and by a Theorem in *Ward*, we have $\overline{2a^2 + x^2} \times \frac{7x}{6}$

$=b$, ſolv'd $x=30$ nearly the Head Diameter, and $35=$ the Length of the Caſk.

Mr. *William Kingſtone's* Anſwer to the ſame.

Let $b=32{,}38029$, $a=97{,}38029$, $d=1077.15$, $x=$ the Length; then $\frac{bx}{7}=$ the Head Diameter, and $\frac{2b^2+\frac{36x^2}{49}\times x\times x}{d}=a$, in Numbers $x^3+2854{,}20421354x=142772{,}5973789$; whence $x=35000082$, and the Head Diam. $=30{,}00007$.

The ſame anſwer'd by *Rimſide*.



Put CD $=32.38029=b$, the Content $97.38029=c$, $\frac{6}{7}=d$, and EF $=x$; Then per Queſtion AB will be equal to dx, and (*per Ward's Young Mathematician's Guide*, p. 421.) the Content is $=\frac{2b^2+d^2x^3}{1077.15}$; hence this Equation $\frac{2b^2x+d^2x^3}{1077.15}=c$; which reduced is $x=35$, and AB $=30$ Inches nearly.

The ſame anſwer'd by Mr. *Lhewelin Davies*.

Let the Bung Diameter given $=b$, the Head Diameter $=6x$, and *per Queſt.* the Length will $=7x$; Then becauſe it is ſpheroidal, we have $\frac{2bb+36x^2\times 7x}{1077.162}=97.38029$ Ale Gallons, that is $14bbx+252x^3=1077.162\times 97.38029$, and dividing this Equation by 252 it will be $x^3+58.249066x=416.24741245$, and ſolving this adfected Equation, x will be found $=5{,}0000156$; whence the Head Diameter will be 30.0000936, and the Length 35.0001092 Inches.

The ſame anſwer'd by Mr. *John Hollingworth*.

Put $b=32{,}38029$, $y=97.38029$, and let $x=$ the Length of the Caſk; Then $\frac{6x}{7}=$ the Head Diam. and $\frac{2b^2+\frac{36x^2}{49}}{1077.15}\times x\times x=y$; Reſolv'd $x=35=$ the Caſk's Length, and the Head conſequently muſt be $=30$.

The

The ſame anſwer'd by Mr. *Sam. Bamfield.*

For the Head Diameter put $6x$, then *per Queſt.* the Length will be $7x$ for the Bung Diam. b, and the Content c; Then *per* common Theorem $\frac{14bbx+252xxx}{1077.15}=c$; From which Equation x is found $=5$. $\therefore$ the Head Diam. $=30$, and the Length of the Caſk $=35$,

The ſame ſolv'd by Mr. *Wm Eneſer, Writing Maſter,* and *Teacher of the Mathematics* in *Ipſwich.*

Put 27461.24178 = the Content in Cubic Inches $=c$; 32.38029 the Bung Diam. $=b$; 0,2618 $=p$; $\frac{6}{7}=d$; and let $x=$ the Length of the Caſk, then will $dx=$ the Head Diam. *per* Queſt. And by Mr. *Robertſon's Theo.* p. 277. of his *Menſuration,* $2bbx+ddx^3=\frac{c}{p}$. Put $\frac{2bb}{ad}=m$, and $\frac{c}{pdd}=n$; then $x^3+mx=n$. In Numbers $x^3+2854.209x=142772.63$. Hence by Converging Series $x=34.995$, and $dx=29.995$. *Q. E. I.*

The ſame anſwer'd by Mr. *Tho. Garrard.*

Put $b=$ the Bung Diam. $=32.38029$, $a=\frac{7}{6}$, $c=$ the Content $=27461.24178$ Inches, and $x=$ the Head Diam. then will $ax=$ the Length, and by a known Theor. for finding the Solidity of the Fruſtum of a Spheroid we have $2bbax+axxx=\frac{c}{p}$ (where $p=\frac{7854}{3}$) which Equation ſolved will give $x=30$, and $ax=35$. both very near.

Mr. Wm. Pirſon, M. W. *of* W. *in* Yorkſhire, Harland Wid, *Mr.* Edw. Rogers, *Mr.* Joſ. Orchard, *Mr.* J. Weolly, *Mr.* Ralph Brockſop, *Mr.* Geo. Godhelp, *Mr.* Ch. Maſon *Jun. Mr* John Peachy, *Mr.* Sam. Towndrow, *Mr.* Roger Widger, *Mr.* John Watchorne, *Mr.* John Wiggleſworth, *Mr.* Benj. Donn, *Mr.* James Collingridge, *Mr.* John Ramſay, *Mr.* Taylor, *and many others, have ſent us very good Solutions to the ſame; but in order to oblige as many of our Contributors as poſſible, we have already been too prolix; therefore muſt refer them to the Catalogue.*

(6) Queſt. 106 anſwer'd by Mr. *John Hollingworth.*

The Log. of 5000 $=3.698970$
The Log. of 3000 $=3.477121$ } by Suppoſition $y=5.51$.

Then $\frac{3.698970}{5.51}=.671\dot{3}1$, the Log. of $4.692=x$.

and $\frac{3.477121}{4.692}=.741074$ the Log. of 5.509, but ſhould

ſhould have been 5.51, ſo the Error is 0,001; but by another Trial I find $y = 5.5092$, and $x = 4.6924$ very near.

The ſame anſwered by Mr. *Richard Gibbons*.

It is plain by Inſpection that x is between 4 and 5, but neareſt the latter; wherefore I ſuppoſe it $= 4.7$, by which divide the Log. of 3000, the Quotient is 0.739813 the Log. of $y = 5.49304$, and $x^y = 4918,8$ too little by 81.2. I next ſuppoſe x a ſmall matter leſs (*viz.*) 4.69, and proceeding as before we get $x^y = 5014.1$, too much by 14.1. Then as 95 3 the Sum of the Errors is to 0,01 the Difference of the Suppoſitions, ſo is 14,1 the laſt Error, to 0,00148. Hence $y = 5\ 51007$, true to five Places of Decimal Parts at the firſt Operation.

This Method of Trial and Error in ſolving Exponentials, was firſt made public (without the Operation) by the learned Mr. *Tho. Simpſon*, in the *Monthly Oracle* for *November* 1737, wherein he obſerves, *That this Method not only extends to any of the moſt intricate Equations where there is but one unknown Quantity, but likewiſe where there are two unknown Quantities*; which is here manifeſted.

Wonderful is the Uſe of this Method in almoſt every Branch of the Mathematicks, wherein I obſerve, *That very ingenious Gentlemen have brought out Solutions by Adfected Equations as high as the 7th and 8th Powers, and at the ſame Time acknowledge the Defect as well as Trouble the ſame is liable to, when compared with this*, which to me ſeems ſomething ſtrange!

The ſame anſwer'd by Mr. *Benj. Donn*.

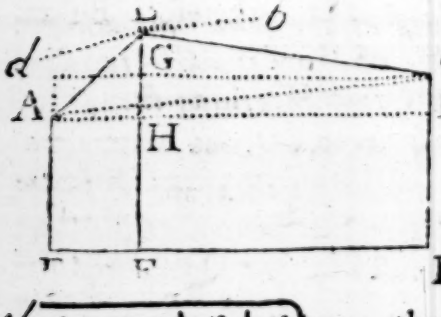
Given $x^y = 5000$, and $y^x = 3000$, *Quare* x, and y, Put X = the common Log. of x, and Y = that of y, L = the Log. of 5000, and l = that of 3000: Then (*per* Queſt. and the Nature of Log^ms) we have $Xy = L$, and $Yx = l$. $\therefore Y = \frac{l}{x}$: Aſſume $x = 5$, and find the Error; then aſſume $x = 4.9$, and find the Error: And ſay as the Difference of the Errors, if alike, or Sum if unlike, is to the Difference of the Suppoſitions; ſo is either Error to a Fourth Number; which added to or ſubſtracted from the proper Suppoſition gives the Value of $x = 4\ 668$: Now for x aſſume 4 668, and working as before, it gives $x = 4\ 6842$; Laſtly aſſume $x = 4\ 6842$, and this gives $x = 4,6914$, and $y = 5.5102$ very near the Truth. After this manner you may proceed to what Exactneſs you pleaſe. So here is little Difficulty in ſolving the moſt troubleſome of Exponential Problems by Logarithms.

The ſame anſwer'd by Mr. *Wm. Kingſtone.*

Given $x^y = 5000$, and $y^x = 3000$. Let $a = $ L. 5000, and $b = $ L. 3000; Then by Logar. $y \text{ L } x = a$, and $x \text{ L } y = b$, conſequently $y = \frac{a}{\text{L}x}$, and $\left(\frac{a}{\text{L}x}\right)^x = 3000$. Put $c = \text{L}\,a$, and let n be aſſumed nearly $= x$, $z =$ their Difference, $m = \text{L}\,n$, and $d = \text{L}\,m$, then by Logariths $x \times c - \text{L.L}x = b$; but $\text{L}x = m + \frac{rz}{n}$ [$r = ,4342944819$,] and $\text{L.L}x = d + \frac{r^2 z}{mn}$; Conſequently $x \times c - \text{L.L}x = c - d \times n + c - d - \frac{r^2}{m} \times z = b$, Hence $z = \frac{b + c - d \times m}{c - d \times m - r^2}$ put $n = 4.7$, then is $z = \frac{-,003384}{,3599}$ $= -,009$, and $n + z = 4.691$; and by repeating the Operation $z = 00017$, Conſequently $n + z = 4,69117$, and $y = \frac{a}{Lx}$ $= 5.51032$.

The ſame was very curiouſly ſolved by Harland Widd, *Mr.* Step. Hartley, *Mr.* Abr. Lord, *Mr.* Geo. Godhelp, *Mr.* Phil. George, *Mr.* John Watchorne, *Mr.* Paul Sharp, *Mr.* Tho. Moſs, *and Mr.* S. Bamfield.

(7) Queſt. 107 anſwered by Mr *Benj. Donn.*



Draw the Lines as in the Scheme; Let $2z = \text{BG} + \text{BH}$. $2d = \text{GH} = 1$, then $z + d = \text{BH}$, and $z - d = \text{BG}$; $a = \text{AH} = 4$, $b = \text{GC} = 16$, $s = \text{AB} + \text{BC} = 22$. Then *(per* 47. E. 1.) $\sqrt{z^2 + 2zd + d^2 + a^2} + \sqrt{z^2 - 2zd + d^2 + b^2} = s$, therefore $2s\sqrt{z^2 - 2zd + d^2 + b^2} = s^2 + b^2 - 4zd - a^2$; for $s^2 + b^2 - a^2$ ſubſtitute m, then $2s\sqrt{z^2 - 2dz + d^2 + s^2} = m - 4zd$. Therefore $4s^2z^2 - 8s^2dz + 4s^2d^2 + 4s^2b^2 = m^2 - 8mdz + 16z^2d^2$. This is a Quadratic Equation, as the Queſtion requires, which ſolved will give the Value of z.

Note, It may be eaſily ſolved by the Nature of an Ellipſe. Hence I draw a *Geometric-Mechanical* CONSTRUCTION.

Draw AE, ED, DC, and FB *ad libitum*; fix two Pins, one on A, and the other on the Point C; over theſe Pins put a Silk (or other) Line $=$ in Length to $2z + AC$, and (the two Ends

Ends being tied together) with another Pin carried along ſo as to keep the Line always ſtreightened, deſcribe the Arch *d b* (being Part of an Ellipſis) and it will cut the indefinite Line FB in B, the Point required. It may alſo be conſtructed by finding a Number of Points in the Curve geometrically by the common Method of deſcribing an Ellipſe.

N. B. By meaſuring the Scheme FB = 9 nearly.

The ſame anſwer'd by Mr. *Paul Sharp*.

Let DC and EA be the Poſts, and FB the Pole. Draw CG and AH perpendicular thereon. Put AB + BC = $2a$, and BC − BA = $2x$; then BC = $a+x$, and AB = $a-x$; alſo put CG = 16 = b, AH = 4 = c, and GH = 1 *per* Queſt. then will BG = $\sqrt{a^2+2ax+x^2-b^2}$ (*per* 47. E. 1.) whence $a^2+2ax+x^2-b^2+1+2\sqrt{a^2+2ax+x^2-b^2} = a^2-2ax+x^2-c^2$, ∴ $\frac{b^2-c^2-1}{2}-2ax = \sqrt{a^2+2ax+x^2-b^2}$. Put $\frac{b^2-c^2-1}{2} = n$, then $n-2ax = \sqrt{a^2+2ax+x^2-b^2}$, which ſquar'd and tranſpos'd gives $4a^2x^2-x^2-4anx-2ax = a^2-b^2-n^2$; Put $\frac{4an+2a}{4a^2-1} = 2p$, and $\frac{a^2-b^2-n^2}{4a^2-1} = -q$, then $x^2-2px = -q$. Whence $x = p \pm \sqrt{p^2-q} = 5.29243$; therefore BF = 9.0714 Feet, the Height of the Pole required.

The ſame anſwer'd by Mr. *John Wiggleſworth*.

Having drawn AK and CG parallel to ED, let AH = 4 = a, KH (= CG) = 16 = b, GH = 1, AB + BC = 22 = c, BH = x, and AB = z; Then (*per* 47. E. 1.) $a^2+x^2=z^2$, $b^2+x^2-2x+1=c^2-2cz+z^2$, by ſubſtituting for z in this laſt Equation we have $b^2-2x+1 = c^2-2c\sqrt{a^2+x^2}+a^2$; Reduc'd $x^2-,5031x = 14.5305383024$; Solv'd $x = 4.07173$. Hence the Length of the Pole or Prop is 9.07173 Feet.

The ſame anſwer'd by Mr. *Will. Pirſſon*.

Let DF = KH = CG = $4c$, and EF = AH = 4 = c, CK = GH = 1, EA = FH = DK = 5, BG = p, AB = e, BC = a, then $a+e = 22 = s$, and $e^2 = s^2-2sa+a^2 = c^2+p^2+2p+1$, but $s^2-2sa+a^2-c^2-2p-1 = p^2 = a^2-16c^2$, and $\frac{s^2+15c^2-2p}{2s} = a = \sqrt{p^2+16c^2}$, Reduc'd gives $p = 3.07173\,14839$ Feet, which added to FG = DC = b makes 9.07173 14839 = the Height of the upright Pole required.

The ſame anſwer'd by *Rimſide*.

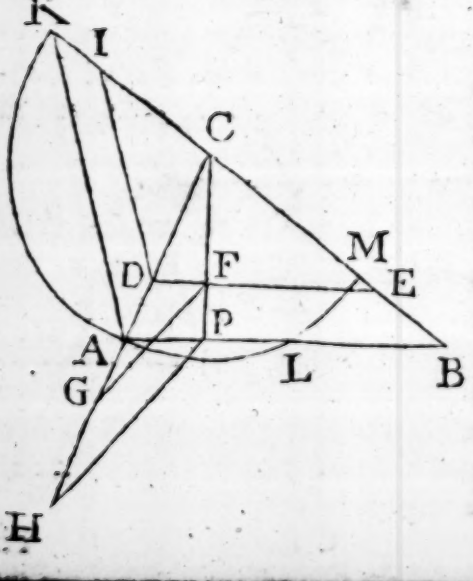
Let AE=5, and DC=6, be the two Poſts, ED=20 their Diſtance, make EF=4, and draw FB perpendicular to ED, and let AB+BC be the Length of the Line when ſtreightned =22, and ſuppoſe AB=x, then BC=$22-x$, and (*per* 47 E.1.) BG=$\sqrt{228-44x+x^2}$, and BH=$\sqrt{x^2-16}$, but BG+GH (=1)=BH, hence this Equation $\sqrt{228-44x+x^2}+1=\sqrt{x^2-16}$, and by Reduction $44x-243=\sqrt{4x^2-64}$, whence x=5.707, and BF=9,0708 Feet, the Height of the Pole, as required.

The ſame anſwer'd by Mr. *Rich. Gibbens*.

Since the Difference of the Height of the Poſts is given = 1 Foot in the two right angled plain Triangles ABH and GBC, we have given AH=4, GC=16, AB+BC=22; Put AB=x, BC=z, and BG=p, then is BH=$p+1$, and (by 47 E.1.) $x^2=p^2+2p+17$, and $z^2=256$ ∴ $239-2p=z^2-x^2$, and $\frac{z^2-x^2}{z+x}=z-x=\frac{239-2p}{z+x}$, to which add $z+x$, and we have $2z=\frac{723-2p}{22}$: From hence and 2d Equation we have this Quadratic $p^2+1.49694p=14.0336$. Reduc'd p=3,07172, which added to 6, the higheſt Poſt.

This Queſtion was truly anſwer'd by Mr. John Hollingworth, Harland Widd, *Mr.* John Woolly, *Mr.* Steph. Hartley, *Mr.* Abr. Lord, *Mr.* Ralph Brockſopp, *Mr.* Roger Widger, *Mr.* Philip George, *Mr.* John Watchorn, *Mr.* Tho. Moſs, *Mr.* William Enefer, *Mr.* William Bevil, *Mr.* Tho. Ward, *Mr.* Sam. Bamfield *and many others.*

(8) Queſt. 108 by Mr. *Joſ. Orchard.*



Draw the indefinite Right Line BK; and CH meeting BK making the Angle BCH = the given Vertical Angle; at any Diſtance take CI = CD, and draw DE ſo, that DE to EI ſhall be in the given Ratio of the Diff. of the Sides to the Diff. of the Segments of the Baſe. Make CF ⊥ DE, and take CG = CD + CF, and CH = the given Sum of the Perpendicular and leſſer Side: Join FG,

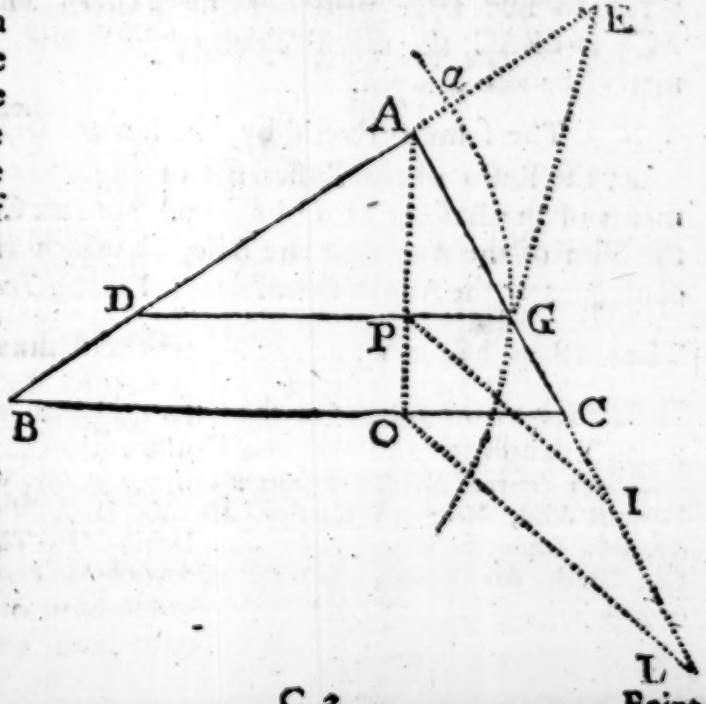
FG, and draw HP ‖ FG meeting CF produced in P; thro' P draw AB ‖ DE, and ABC will be the Triangle required.

DEMONSTRATION. With the Radius CA on the Centre C deſcribe the Semicircle MAK, and join AK and DI; Then ſince DE to DI are in the given Ratio as above by Conſtruction, and the Triangles EDI and BAK ſimilar, it will be ED: to EI:: BA: BK. But (by Cor. 37 *E.* 3.) BA×BL=BK × BM ∴ BM: BL:: BA: BK:: ED: EI. Again, becauſe DE ‖ to ABCD: CF:: CA: CP; Compounded CD+CF: CF:: CA+CP: CP, and becauſe GF ‖ to HP, CG: CF:: CH: CP *ex æquo* CD+CF: CG:: CA+CP: CH; But CG=CD+CF. ∴ CH= CA+CP, and the Verticle the ſame by Conſtruction. *Q. E. D.*

Method of CALCULATION. In the Triangle BAK we have the Angle K=½ the Vertical Angle, and the Ratio of the Sides BA to BK, which are as the Sines of their oppoſite Angles A and K, whence all the Angles in this and the required Triangle are eaſily found. Then in the Triangle APC we have the Sum of the Sides CA and CP, and the Angle CAP, whence ACP is known becauſe the Triangle is right angled: Say as Radius: CA+CP:: Tangent ½ Angle ACP: AP. Whence the reſt may be found by the Caſes in plain Trigonometry,

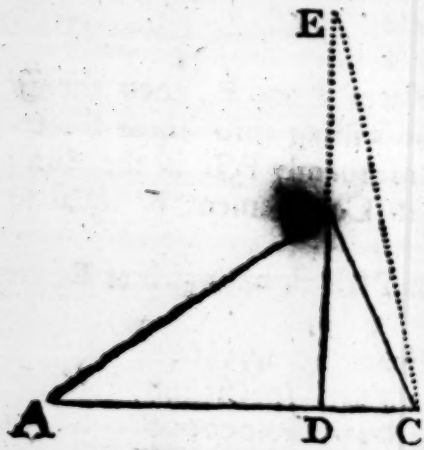
The ſame anſwer'd by Mr. *Tho. Garrard.*

Make DE (ſee the following Figure) of any convenient Length, which divide in the Point *a*, ſo that D*a* be to DE in the given Ratio of the Diff. of the Sides to the Diff. of the Segments of the Baſe, and upon the Point D deſcribe the Arch AG, draw EG making the Angle AEG = half the given Vertical Angle, From the



Point of Interſection G draw GA making the Angle AGE= Angle AEG, and join DG; ſo will the Triangle ADG be ſimilar to the Triangle ſought. Continue AD, AG, and AP (perpendicular to DG) to a convenient Length; Then make GI=AP, and draw IP; alſo make AL = the given Perpendicular and leſſer Side, and draw LO parallel to IP; Laſtly through O draw BC parallel to DG, ſo will ABC be the Triangle required. The whole Operation is ſo plain, that I think it needs no Demonſtration.

The ſame anſwer'd by Mr. *Paul Sharp*.



Since the Vertical Angle is given, and the Ratio of the Diff. of the including Sides and the Diff. of the Segments of the Baſe, the Angles at the Baſe are alſo given (*per* Theo. 18. p. 28. of *Thacker's Miſcell.*) Therefore (*per* 22 *E.* 1.) deſcribe the Triangle ABC with the given Angles, and let fall the Perpendicular BD, make DE=BC+BD, and draw CE, then in the Triangle CED there is all the Angles and Side DE given to find DC; which being known, and the Angles ACB and BAC, the whole Triangle ABC will, *per* Trigonometry, be alſo known.

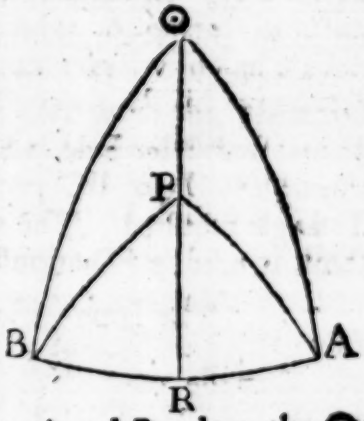
The ſame anſwer'd by Mr. *Richard Gibbons*.

Let the Ratio of the Difference of the Sides and the Segments of the Baſe be as d to b; and put s = Coſine of half the Sum of the Angles at the Baſe, all which are given, and conſequently the Angles themſelves: For, by *Thacker's Miſcell.* Theo. 18. p. 28. as $d : b :: s : \frac{sb}{d}$ = the Coſine of half the Difference of the Angles at the Baſe. Hence we have a ſimilar Triangle given to draw a Conſtruction therefrom.

We alſo received Solutions to this Queſtion from Mr. William Pirſſon, Harland Widd, *Mr.* Steph. Hartley, *Mr.* Abr. Lord, *Mr.* Ralph Brackſop, *Mr.* Llewelin Davies, *Mr.* Benj. Donn, *Mr.* Tho. Moſs, *Mr.* Cha. Smith, *Mr.* Taylor, *and many others, as may be ſeen in the Catalogue.*

(9) Queſt.

(9) Queſtion 109 by Mr. *John Hollingworth.*



Let B and A repreſent the two Places in the Artic Circle, P the Pole, then there is given PA = PB = 23° 30, and the ∠BPA = 52° = the Diff. of Long. and ∠BPR = ∠APR = 26° = ½ the Diff. Now A⊙ = 90°, and B⊙ = 90°, for 'tis plain that the Sun muſt be 90° diſtant from each Place, otherwiſe he could not riſe at A when he ſets at B. Let BRA be the Arch of a great Circle paſſing thro' both Places A and B; then the ⊙ will be the Pole of a great Circle paſſing thro' thoſe Places. Therefore ⊙R = 90°, and conſequently P⊙ is the Sun's Declination from the Pole, and its Complement is equal to the Sun's Declination = PR.

Now in the Triangle PRA or PRB right angled at R, we have the following *Analogy:*

As Coſ. Angle APR =	26° 00		9.953660
is to Cot. of AP =	23	30	10.361698
ſo is Radius -	90	00	10.000000
to the Cot. of PR	21	21	10.408038 = the

Sun's Declination North, the true Anſwer.

The ſame anſwer'd by *Harland Widd.*

Here are given the Lat. 66° 31′ North, and the Length of the Day = Diff. of Long. converted into Time; conſequently the Complement of ½ the Diff. of Long. gives the Aſcenſional Diff = 64°. Then ſay as Tang. of Lat. : to Radius : : ſo Sine of Aſcenſional Diff. to Tang. of Declination = 21° 20′. *Q. E. I.*

The ſame anſwer'd by Mr. *Cha. Maſon* Jun.

'Tis demonſtrable from the Stereographic Projection of the Sphere on the Plain of the Ecliptic that the Length of the Day will be equal 3ʰ 28′ = 52° in Motion, the given Diff. of Long.; Whence, and *per* Spherics, may be drawn this univerſal Theorem for all ſuch Queſtions, *viz. As Tangent of the Latitude* 66° 31′ *(under the Artic Circle) : to Rad. : : ſo is the Coſine of the Time from Noon* 26° *(when the Sun riſes or ſets) : to Tangent of* 21° 20′ *the Declination.*

The ſame anſwer'd by Mr. *Paul Sharp*.

Here are given the Latitudes of the two Places = 66° 30′ (the Nat. Cotang. of which *a*) and their Difference of Long. = 52°, half of which is = 26° = the Sun's Diſtance from the Meridian at his Riſing and Setting, the Nat. Coſine of which call *b*, and Radius = 1; Then by the Elements of ſpherical Trigonometry, we have *ab*, 3908 the Nat. Tang. of 21° 20′ 45″ the Sun's Declination; anſwering to the 17th Day of *November*, or 3d of *January*, the Time required.

The ſame anſwer'd by Mr. *Will. Spicer*.

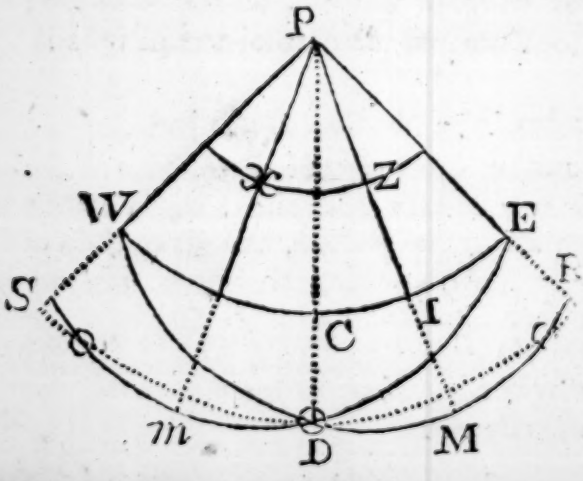
Put *s* = Nat. Sine of 4^h 16′ = 64° the Aſcenſional Difference, *b* = the Tang. of Latitude, and *x* = Tang. of the Sun's Declination. Then (*per* Spherics) *b* : 1 :: *s* : *x*; Therefore $x = \frac{s}{b} =$,390805, which anſwers 21° 20′ 45″ the Decl. required.

The ſame anſwer'd by Mr. *Will. Kingſtone*.

A Place ſituated under the Artic Circle, in the Middle betwixt the two given Places, ſhall have the Sun in the Meridian at the ſame Time it riſes to the Weſtermoſt and ſets to the Eaſtermoſt of the two given Places; and conſequently (26°) half the Diff. of Long. is the Sun's Amplitude from the South of the Middle Place; Therefore (*per* Spheries) as Rad. : Coſ. 26° :: Coſine Lat. 66° 31′ to Sine Declination South = 21° 21′ nearly.

The ſame anſwered by *Rimſide*.

Let P repreſent the Pole, *z* and *x* the Zeniths of the two Places, WCIE the Equinoctial, WDMR the Horizon of the firſt Place, and ED*m*S that of the latter; then thro' D, the Interſection of the two Horizons, draw RDS a Parallel of



Declination, ſo that the Sun when at D ſet to the Inhabitants of *z*, and at the ſame Time riſe to thoſe of *x*, and CD will will be the Declin. required South. In the ſimilar Triangles W I M and W C D, right angled at I and C, there is gi-

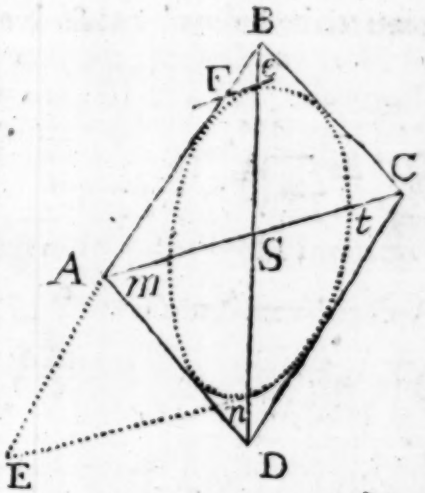
ven

ven WI = 90°, IM 23° 30′ the Latitude, and WC = 64° the Compl. of half the Diff. of Longitude; then by Spherics, as Radius : Sine Complem. of half Diff. of Longitude : : Tang. of Lat. : Tang. CD = 21° 21′ the Declination.

This Queſtion was alſo curiouſly anſwered by M. W. *of* W. *in* Yorkſhire, *Mr.* Steph. Hartley, *Mr.* Abr. Lord, *Mr.* Tho. Moſs, *Mr.* Geo. Godhelp, *Mr.* Tho. Garrard, *Mr.* Sam. Bamfield, *and many others.*

(10) Queſt. 110. anſwer'd by the Propoſer Mr *Paul Sharp*.

Let ABCD be the Rhomboides, *n*, *m*, *e*, *t* the Ellipſis; Put AB = CD = *a*, AD = BC = *b*, and half the Diff. of the Diagonals = *d*, and half their Sum = *y*; then will $2d^2 + 2y^2 = 2a^2 + 2b^2$ (ſee *Newton's Algebra*, p. 117). $\therefore y = \sqrt{a^2 + b^2 - d^2}$, whence the Diagonals are known. Let BD = 2*c*, AC = 2*p*, and *e*S = S*n* = *x*, then B*n* = *c* + *x*, and B*e* = *c* − *x*. Draw E*n* and F*e* parallel to AS, then

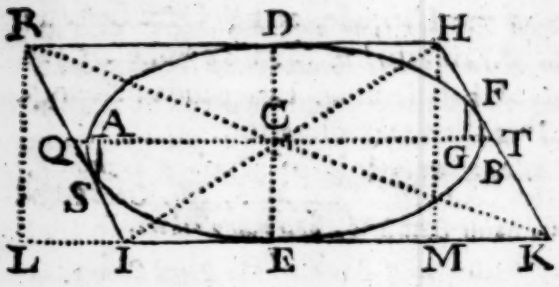


(*per* 4 E. 6) $c : p :: c - x : \frac{pc - px}{c}$ (= F*e*) $:: c + x : \frac{pc + px}{c}$ = E*n* : E*n* × F*e* = $\frac{p^2c^2 - p^2x^2}{c^2} = \overline{mS}^2$ (*per* Conics) whence $mS \times eS = \frac{px}{c}\sqrt{c^2 - x^2}$, or $\frac{p^2c^2x^2 - p^2x^4}{c^2}$ muſt be a Max. $\therefore \frac{2p^2c^4x\dot{x} - 4p^2c^2x^3\dot{x}}{c^4} = 0$, whence $c^2 - 2x^2 = 0$ $\therefore x = \frac{c}{\sqrt{2}} = eS$, $mS = \frac{p}{\sqrt{2}}$. Conſequently the Area of the Ellipſis is $\frac{2c}{\sqrt{2}} \times \frac{2p}{\sqrt{2}} \times ,7854 = 1.5708pc$. Q. E. I.

The ſame anſwer'd by Mr. *Cha. Smith*.

It may be very eaſily demonſtrated that the inſcribed Ellipſis will be the greateſt * when the tranſverſe Diameter AB lies parallel and in the Mid-way between the two longeſt Sides

* *This is quite different from the Principles on which the Propoſer's Solution is founded, whom we preſume was miſtaken in ſolving his own Queſt. his Solution being only applicable to a Rhombus.*



(of the Rhomboides) RH and IK, being Tangents to the Curve in D and E the Extremities of the Conjugate Diameter RI and HK the ſhorter Sides Tangents to the Points F and S. Now there is given $l =$ the longeſt Side, $s =$ ſhorteſt, and $d =$ RK $-$ IH the Difference of the Diagonals. Let $x =$ IH, and $x + d =$ RK, $y =$ LI $=$ KM, then $l - y =$ IM, and $l + y =$ LK, and (*per* 47 E. 1.) $s^2 - y^2 =$ $\overline{RL}^2 = \overline{HM}^2$. Hence by the ſame Prop. of *Euclid*, $x^2 = s^2 - y^2 + \overline{l - y}^2$, and $\overline{x + d}^2 = s^2 - y^2 + \overline{l + y}^2$. Theſe two Equations added together make $2x^2 + 2dx + d^2 = 2s^2 + 2l^2$. Reduced $x = \frac{\sqrt{4l^2 + 4s^2 - d^2} - d}{2}$ = the Diagonal IH $\therefore y =$ MK is known, and HM $=$ DE $= 2c$ the conjugate Diam. Put $2z =$ AB the Tranſverſe, and draw the Semiordinate FG $= v$ from the Point of Contact F where the Tangent HK touches the Curve. Now QT being parallel is $=$ to RH $= l$.

Firſt *per* ſim. Triangles $2c : y :: v$ GT $= \frac{vy}{2c}$, hence CG $= \frac{cl - vy}{2c}$, alſo AG $= \frac{2cz + cl - vy}{2c}$, and GB $= \frac{2cz - cl + vy}{2c}$, (*per* Conics) as $\overline{CD}^2 : \overline{AC}^2 :: \overline{FG}^2 :$ AG $\times$ GB (*i.e.*) $c^2 : z^2 :: v^2$, $\frac{2cz + cl - vy}{2c} \times \frac{2cz - cl + vy}{2c}$, which properly reduc'd is $z^2 = \frac{c^2l^2 + v^2y^2 - 2clvy}{4c^2 - 4v^2}$. Again, as CG : GB :: AG : GT, or $-\frac{cl - vy}{2c} : \frac{2cz - cl + cy}{2c} :: \frac{2cz + cl - cy}{2c} : \frac{vy}{2c}$; Reduc'd $z^2 = \frac{c^2l^2 - clvy}{4c^2} = \frac{c^2l^2 + v^2y^2 - 2clvy}{4c^2 - 4v^2} \therefore lyv^2 - cl^2v - cy^2v = lc^2y$, and $v^2 - \frac{cl}{y} - \frac{cy}{l} \times v = -c^2$. Hence v may be found, the reſt being ſuppoſed known Quantities, and thence z the Semi-tranſverſe of the Ellipſis.

Mr. *Joſeph Orchard* has favoured us with a curious Solution to this Queſtion, founded on the following Principles, *viz.*

That

That the Area of the greateſt Ellipſis that can be inſcribed in any given Rhomboides is = the Area of that Rhomboides multiplied by ,78539 *&c.* And putting $2b$ = the longeſt Side of the Rhomboides, $2c$ = the ſhorter Side, and $4d$ = the given Difference of the Diagonals, by an Algebraic Proceſs he finds the Area of the whole Rhomboides $= 4\sqrt{d^2-c^2 \times d^2-b^2}$, which x'd by ,78539 *&c.* determines the Area of its greateſt inſcribed Ellipſis.

PARADOX *by Mr.* Sam. Hammond *of* Nottingham.

A GENTLEMAN, who is to Whims inclin'd,
His Gardener the other Day injoin'd
To plant an Hundred Cheſnut Trees next Year,
So as no Row amongſt them may appear;
Yet when to them he adds another Tree,
There Fifty, equal, reg'lar Rows may be.
The Gardener has a projecting Brain,
But all his Thoughts are ſpent on this in vain;
And therefore, (fearing he ſhould loſe his Place)
Deſir'd that I would humbly ſtate his Caſe
To you, Sirs, begging Aid; which (I deſire ye)
Vouchſafe to give him in your next Year's *Diary*.

Anſwers to the Ænigma's in laſt Year's Diary.

1. NOISE.	5. PAPER.
2. The BRAIN.	6. A CHAIR.
3. A CUSHION.	7. A TOBACCO PIPE.
4. A SIEVE.	8. A SUN DIAL.

Mr. *Samuel Hammond* of *Nottingham* anſwers all the Ænigmas, Anagram, Paradox, and Rebus's thus:

A *Baronet*, living near SALISBURY City, 2d *Reb.*
Whoſe *Father* reſigning his Breath
Before the old *Grandfather*, was (which is Pity,
Born after his *Grandfather's* Death;
Who a *Baronet* being, the *Infant* became
Heir both to his *Title* and *Pelf*
The *Minute* when *born*, tho' his *Father* the ſame
Had never enjoyed *Himſelf*; } *Paradox.*
At *School* he with *Learning* ne'er puzzled his BRAIN, 2
Of all that he *read* little knew;

For,

For, like a LAWN-SIEVE, he the *Bran* would retain, 4
But let all the *Flour* run thro'.
His *fav'rite* Companions were *Boys* that were *rude*,
Dull, *ignorant*, *vulgar*, and *bold*;
And PAPER-*Kites*, *Chuck*, and *Span-Farthing* purſu'd 5
'Till full *One and Twenty* Years old.
When quite from *Mamma* and his *Guardians* got free,
His *Eſtate* being then in his *Hand*,
With *Huntſman* and *Groom* as familiar was he,
As if they were *Peers* of the *Land*:
With *them*, and *ſuch-like*, cock'd his PIPE and ſat drinking, 7
Join'd their NOISE 'bout a *Horſe* or a DOG; 1, *Anagr.*
'Till, being diſabled, from *Talking* or *Thinking*,
He wallow'd in *Dirt* like a *Hog*.
His *Face*, like a SUN-DIAL preſently ſhone, 8
His Foot, on a CUSHION and CHAIR, 3, 6
As certain as any BAROMETER's grown 1 *Reb.*
In telling the Change of the *Air*.
Be warned, ye Youth, leſt too late ye repent,
Both Sexes of ev'ry Degree;
For as are the Manners of thoſe you frequent,
Your Manners will certainly be.

Mr. *Samuel Bamfield's* Anſwer to the Ænigmas.

Would bounteous Heaven permit, *my Choice* ſhould be
Such Friends as could increaſe Felicity:
Thoſe whoſe capacious MEM'RIES ſhould contain 2
All valuable Things; — They them explain;
Should know why *Echo* did a NOISE repeat 1
And how to mark the HOURS* *Sol* does compleat 8
Should ev'ry uſeful, learned Science know,
Nay, all that public PAPERS e'er can ſhew: 5
Then ſhould I think myſelf more richly bleſt
Than thoſe on SARSENET CUSHION'd CHAIR who reſt; 4, 3, 6
That ſpend their Days chiefly with PIPE and Glaſs, 7
Contriving how Time idly on to paſs;
For this cannot ſuch ſolid Pleaſure bring
As that which flows from the *Pierian* Spring.

* Alluding to a Sun-Dial.

All the *Ænigmas*, *Anagram*, *Paradox*, and 2d *Rebus* anſwer'd by Mr. *Tho. Royle* of *Syſton*. [1, 2, 3, 7, 2 *Reb.* 4
NOISE, MEMORY, CUSHION, PIPE, SALISBURY, SIEVE, DOG, PAPER, CHAIR, DIAL, are right I believe, *Anag.* 5, 6, 8

The BARONET needs muſt be in his *Mam's* Belly, *Paradox.*
When's *Father* and *Grandfather* dy'd; but (to tell ye
The Truth) I've no Notion of *Rebus* the firſt,
Yet hope, *Sirs*, my *Anſwer* is none of the *worſt.*

New MATHEMATICAL QUESTIONS *to be anſwer'd in the next* Year's Diary.

(1) Queſtion 111 by *Harland Widd.*

AN Ellipſis whoſe Area is 1752, and the Area of its greateſt inſcribed Parallelogram is to the Area of its greateſt inſcribed Square as 3 to 2; It is required to determine this Ellipſis?

(2) Queſtion 112 by Mr. *Abr. Lord.*

As I chanc'd at a Tavern, being late in the Night,
Some young Sparks were drinking of good *Liſbon* White:
A young Gauger in Company happen'd to be,
Boaſting of his Skill in Stereometry.
A Youth took him up, with this Queſtion ſtraightway,
And a Wager upon't did immediately lay,
That in one Year, he could not authentickly ſhew
What Wine he had drank? by the *Data* below *.
To work the young Gauger he inſtantly goes,
But all to no Purpoſe! his Wager muſt loſe.
Therefore Artiſts, by me, he your Aid does explore,
And ſuch fooliſh Wagers he'll venture no more.

* *They drank in a conical Glaſs, whoſe Diameter at Top was* x, *the Depth* $2x$, *and the Content* $\frac{1}{2}x^3$ *Inches; and he had drank Ten Glaſſes.*

(3) Queſtion 113 by the ſame.

It is required to find a General Theorem, with the Inveſtigation, to inſcribe the greateſt Parallelogram poſſible in the Lune of *Hippocrates*, the Radius of whoſe outward Circle is $= a$, of its Inward $= b$, and the Diſtance of their Centres $= c$?

(4) Queſtion 114 by Mr. *Richard Gibbons.*

A Ship bound from the *Lizard* to a Port on the *American* Coaſt, firſt ſail'd upon a Parallel 200 Leagues, then directed her Courſe 120 Leagues towards her intended Port (between the S. and W.) which ſhe then changed, and ſteered due South 80 Leagues; and then by Obſervation was in 44° 35′ N. Lat. and 250 Leagues due Eaſt off her intended Port: Required the Lat. and Long. of the intended Port?

(5) Queſtion 115. by *Tabularius.*

Given the Altitude of a ſemi-Parabolic Spindle = 31.3 (= *b*) and the Radius of its Baſe = 20 (= *c*): Required the Radius of the inſcribed Sphere?

(6) Queſtion 116 by Mr. *Roger Widger.*

The Perimeter, Diff. of the Segments, and the Ratio of the Line biſecting the Baſe to that biſecting the vertical Angle given to determine the Triangle.

(7) Queſtion 117 by Mr. *Paul Sharp.*

Given the Diff. of the two parallel Sides of a Trapezoid = 5.642224 Poles, and the Area one Acre: *Quare* each Side when the Perimeter is a *Minimum?*

(8) Queſtion 118 by Mr. *Thomas Moſs.*

To find on *May* the 20th 1752, Lat. 52° 32′ North, in what Direction, with regard to the Meridian, an Object muſt be fixed, making an Angle of 54° with the Plane of the Horizon; ſo the Angle included by the Meridian, or North and South Line, and Shadow of the ſaid Object at 3 o'Clock ſhall be a *Minimum?*

(9) Queſtion 119 by Mr. *William Spicer.*

Being out one dark Night, at ſome Diſtance from me I obſerved the Light of a Candle, but walking in a right Line 60 Yards towards it (the Light not moving) the Light which I then obſerv'd appear'd to me to be as 3 to 2 of that which I obſerv'd at firſt; *Quare* the Diſtance of the Light from me when I firſt obſerv'd it?

(10) Queſtion 120 by Mr. *Charles Smith.*

What are the Diameters and Length of a Caſk of the firſt Variety, whoſe Content is 350.703 A. G. the Content of its greateſt inſcribed Cylinder 231.706, and the tranſverſe Axis of the Spheroid of which the Caſk is the middle Fruſtum 86.458 Inches?

New Ænigmas to be anſwer'd in next Year's *Diary.*

(1) Ænigma 77 by Mr. *John Pickburn* of *Kirkby.*

INDULGENT Nature plac'd me ſo
There's ſome above me, more below;
Which is (as *Sages* all agree)
A State moſt near Felicity.
But from my Fate you'll own 'tis plain
E'en ſuch are not exempt from Pain:

Like

Like *Sol* I daily ſet and riſe,
And tho' diſcern'd by diſtant Eyes,
With thoſe more near have always been
Quite overlook'd, or rarely ſeen.
Since none admire my Voice, I keep
The wakeful Hours in Silence deep,
And chuſe to ſing while others ſleep.
No Animal beneath the Sky
Lives ſo irregular as I;
Some Days my Patron is ſo good
Five hundred Times he gives me Food;
At other Times, by Doom ſevere,
I faſt whole Months, perhaps a Year.
Like *Tantalus*, my Fate is ſuch,
When *Ale* or *Wine* I almoſt touch
(While I advance to meet the Cup)
A baſe Inferiour drinks it up.
By Underlins I'm thus abus'd,
Nor by Superiors better us'd;
When Chance, or Age, their Strength decays,
The Burden's plac'd on me for Eaſe:
This I muſt bear, altho' decreed
Sometimes to rule, and always lead.
But one may loſe a juſt Poſſeſſion
Either by Fraud, or by Oppreſſion;
Tho' that is hard to undergo
I'm often treated worſe than ſo;
Jack Pudding, dancing at a *Fair*,
In antick Forms to make you ſtare,
Provokes me till I roar aloud;
Then throws my Guts among the Croud.
But if ſome dire Diſorder ſeize
My Form, and on my Vitals preys,
Deſpis'd, and ſhunn'd, without Relief,
I die, conſum'd with waſting Grief!
Nor, can my Place be well ſupply'd
E'er ſince that famous *German* dy'd
Who could rebuild my waſted Frame,
By which he gain'd immortal Fame.

(2) Ænigma 78 by Mr. *Samuel Hammond* of *Nottingham*.

CREATED for the Preſervation
Of Animals of ev'ry Station,
I anſwer well the End deſign'd
In all, except the *Human Kind*.
But this Defect ſprings from Abuſe,
For th' Reſt (content with nat'ral Uſe)
Only when Cauſe appears regard me,
And when th' Occaſion's paſt diſcard me.
Whilſt *Man* (reverſe to Reaſon's Laws)
Makes me exiſt without a Cauſe,
And of Exiſtence does debar me
When there are many Cauſes for me.

From

From me flows half Man's Misery,
And half the rest's for Want of me;
By me he many Dangers shuns,
And into many Dangers runs.
Thro' me the Wretched Life desire,
And oft unwillingly expire;
Tho' thro' me many senseless Elves
Stab, *poison*, *hang*, and *drown* themselves.
I'm faithless to the last Degree,
Yet Foe to Incredulity;
For (to convince you I am such)
I commonly believe too much.
An hearty Friend to Superstition,
And often prophesy from Vision;
Pretend to see the Consequence
Of Actions, and foretel Events,
Tho' always in an evil Sense.
I sometimes deal in *Necromancy*,
Assisted by the Strength of Fancy;
With whom more Spirits I engender
Than e'er were rais'd by th' *Witch* of *Endor*.
Altho' a Consequence of Sin
I Heaven help the Good to win;
Yet, for the most part, exercise
My Talents on Uncertainties.

(3) Ænigma 79 by Mr. *Richard Peat* of *Wirksworth*.

Ye *Ænigmatic* Tribe attend
To me, who am your constant Friend;
'Tis I preside o'er *Human Kind*,
I comprehend the spacious Mind:
Nay, Kings themselves submit to Me
While Subjects from my Yoke are free.
'Tis I the Man of Breeding trace,
Tho' sometimes to my own Disgrace.
I, o'er the Proud triumphant sit,
Regardless both of Worth or Wit:
At Church, or Play-house, I resign
The Honours which by right are mine;
Yet with a *Friend* can *there* be free,
Preserve my Place and Dignity.
When o'er the Ladies I bear Sway
I'm dress't in all the Pride of *May*;
But when with Man I go, alack!
Am dress'd in melancholy Black:
But hold; — I have so much reveal'd,
My Name cannot be long conceal'd.

(4) Ænigma 80 by *Philænigmata*.

The *Riddle* of *Riddles!* it dances and skips,
It is seen in the Eyes, but cheats with the Lips;
It seldom is known, but oftentimes read,
It's as light as a Feather, or heavy as Lead;

If

If it meets with its Match, it's happily caught,
If Money can buy it, it's not worth a Groat.

(5) Ænigma 81 by Mr. *J. Woolley.*

FROM the dark Bowels of old Mother *Earth*,
I do originally claim my Birth;
Was try'd by Fire, then to Perfection roſe,
But firſt I ſuffer'd hard relentleſs Blows:
And now a kind of *Monſter* I appear,
Without a Head, my Body thin and ſpeare;
A moſt devouring Mouth I have, you'll find,
And that, (ſtrange Contradiction!) comes behind.
Each ſhining *Beau*, ſhould I withdraw my Aid,
And ſparkling *Belle* would ſhun the *Maſquerade*.
Ye *Britons*! tho' I'm much confin'd at Home,
I oft, with you, to diſtant Nations roam;
The raging Seas my Progreſs cannot bound,
For I the World with *Anſon* travell'd round.
The Fair my Services will freely own,
For Night and Day, in public and alone,
They know my Uſe, I wait at their Command,
And take Directions from the whiteſt Hand:
To pleaſe them I thro' various Windings range,
Yet go ſtraight forward; that, you'll ſay, is ſtrange;
Yet, what's more ſtrange, if I much Service do,
A *Driver* I muſt have, and *Leader* too;
By which the Fair oft my Reſentment feel,
And they as kindly wiſh me at the *D——l*;
Nay, oft diſcard me, tho' not much in Fault,
And all my Services are ſet at Nought:
One of our Siſterhood then takes my Place,
For you muſt know we are a num'rous Race;
All *Females* too, all uſeful in our Kind:
From what I've ſaid, my Name you'll quickly find.

(6) Ænigma 82 by Mr. *William Heaford.*

THO' I, alas! a Priſ'ner be, my Trade is Priſ'ners to ſet free;
No Slave his Lord's Commands obeys with ſuch inſinuating Ways:
My *Genius* piercing, ſharp, and bright, wherein the Men of Wit delight,
The *Clergy* keep me for their Eaſe, and turn and wind me as they pleaſe.
A new and wondrous *Art* I ſhew, of raiſing *Spirits* from below; [fright.
In *Scarlet* ſome, and ſome in *White*, they riſe, walk round, yet never
In at each *Mouth* the *Spirits* paſs, diſtinctly ſeen as thro' a *Glaſs*;
O'er Head and Body make a Rout, and drive at laſt all *Secrets* out:
And ſtill the more I ſhew my *Art*, the more they open ev'ry *Heart*.
A greater *Chemiſt* none than I, who from Materials hard and dry, [Still.
Have taught Men to extract with Skill, more precious Juice than from a
Altho' I'm often out of out *Caſe*, I'm not aſham'd to ſhew my Face:
Tho' at the *Tables* of the *Great*, I near the Side-board take my Seat;
Yet, the plain '*Squire* when Dinner's done, is never pleas'd till I make one,
He kindly bids me near him ſtand, and often takes me by the Hand.
I twice a Day a *Hunting* go, nor ever fail to ſeize my Foe,
And when I have him by the *Poll*, I drag him upwards from his *Hole*,
Tho' ſome are of ſo ſtubborn Kind, ſometimes I leave a *Limb* behind:
I hourly wait ſome *fatal* End, for I can *break*, but ſcorn to *bend*.

The Letters i, ii, &c. shew the Queſt. the Figures the Ænig. each anſwd.

MR Rich. Abbot all Æ. in Ver. but 2 and 7. both Reb. and Anag. pr. 1 Reb. and 1 Æ. Mr Tho. Allen ii, ix. all Æ. but 7. both Reb. Mr Ralph Brockſop ii, v, viii, ix. all Æ. but 7 in Ver. both Reb. Par. and An. pr. 1. Mr Wm Bevil i, ii, iii, v, vii, ix. prop. ii. Mr Sam. Beardſley all Æ. but 8 in Ver. Mr Sam. Bamfield all Q. all Æ. in Ver. pr. 1 Æ. Mr Wm Bailey all Æ. in Ver. but 7. Par. both Reb. and An. Mr James Collingride i, ii, v. all Æ. in ver. prop. 1 Q. Mr John Cheſter, Mr Jona. Coley 3, 5, 6. Mr Lhewelin Davies i, ii, v, viii, ix. Mr Ben. Donn all Q. all Æ. but 8 in Ver. Par. both Reb. An. and calc. Ecls. Mr Wm Enefer i, ii, v, vii. Mr Edw. Griffiths all Æ. but 2 and 8. pr. 1 Q. Mr Tho. Grimes ii. all Æ. but 1. Mr Geo. Godhelp ii, v, vi, vii, ix. Mr Ri. Gibbons all Q. but iii and iv. all Æ. in Ver. but 8. Par. both Reb. Anag. prop. i Q. and 1 Æ. Mr Ph. George v, vi, vii, viii. prop. 1 Q. Mr Ja. Gane all Æ. in Ver. Mr T. Garrard i, ii, iv, v, vii, viii, ix. Mr G. Harewel all Æ. in V. Par. both Reb. An. pr. 1 Par. Mr J. Hollingworth ii, iv, v, vi, vii, ix. all Æ. but 1, 2, and 8. Par. An. calc. Ecl. pr. ii Q. and 1 Reb. Mr St. Hartley all Q. but iii and iv. all Æ. in Ver. but 7. Par. both Reb. An. prop. 1 Æ. Mr Harland Widd all Q. but iii, and prop. 1. Mr Will. Heaford all Æ. but 2 and 8. Mr Tho. Hare v, vii. 1, 2, 3, 5, 6, 8. both Reb. and Anag. prop i Q. and 1 Æ. Mr. Sam. Hammond all Æ. in Ver. Par. both Reb. and An. prop. 1 Æ. and 1 Par. Mr Fra. Joce all Æ. in Ver. but 7 and 8. Par. both Reb. Anag. Mr Wm Kingſtone all Q. but viii. all Æ. Par. both Reb. An. prop. ii Q. Mr Nathan Lomax all Æ. in Ver. Anag. prop. 1 Æ. 1 Par. and 1 Reb. Mr Abr. Lord all Q. all Æ. but 2. Par. both Reb. Anag. calc. Ecl. prop. iii Q. Mrs Grace Lackwit 1, 2, 3, 5, 6. prop. 1 Æ. Mr Chr. Maſon Jun. ii, v, ix. Mr Tho. Martin *Caſtlegate* all Æ. Mr Tho. Moſs all Q. but iii. 1, 3, 4, 5, 6, 8. prop. iii Q. Mr Rob. March all Æ. in Ver. but 7. F. F. Mingle all Æ. but 4. Par. both Reb. An. prop. 1 Æ. Munks Noly. Nodnol Yloff all Æ. in Ver. but 7 and 8. Anag. prop. 2 Æ. Mr Joſeph Orchard i, ii, v, viii, ix, x. all Æ. but 1 and 2. both Reb. Mr Rich. Peat prop. 1 Æ. Mr Will. Pirſſon v, vii, viii. prop. i Q. Mr John Pickburn prop. 1 Æ. Mr John Peachy ii, v. all Æ. in Ver. but 1. Mr Rob. Pearſon 4, 5, 6. prop. 1. Mr John Palmer prop. 1 Æ. Mr Tho. Pooke ix. all Æ. but 2 in Ver. Anag. Philænigmata prop. 1 Æ. Mr John Randles ii. all Æ. but 2, 8. prop. i Q. Mr Edw. Rogers v, vi, vii. Mr Alex. Rowe ii. all but 5 Æ. in Ver. both Reb. prop. 1 Reb. 2 Par. 1 French Æ. Mr John Ramſay v, vii. 1, 2, 3, 4, 5, 6. Par. both Reb. Anagr. prop. ii Q. 1 Æ. Mr T. Royle all Æ. in Ver. Par. both Reb. Anag. Rimſide i, ii, v, vii, viii, ix. Mr John Lewin Staughton all in Ver. both Reb. An. prop. 1 Æ. 1 Par. Mr Tho. Smith all Æ. in Ver. but 2 and 7. both Reb. An. prop. 1 Reb. Mr Sam. Sector all Æ. Mr Will. Swift all in Ver. Par. both Reb. Anag. prop. 2 Æ. 1 Par. Mrs Sarah Swift all in Ver. Par. both Reb. An. prop. 1 Æ. Mr Paul Sharp v, vi, vii, viii, ix, x. 2, 3, 4, 5, 6, 7. Par. both Reb. Anag. pr. ii Q. Mr John Stiles 3, 5, 6, 8. Par. and 1 Reb. Mr Cha. Smith i, ii, viii, x. pr. 1 Q. Mr Will. Spicer i, ii, v, vii, ix, x. pr. 2 Q. Mr Th. Towndrow Jun. pr. 1 Æ. Mr Sam. Towndrow v. pr. 1 Q. Tabularius x. pr. 1 Q. Mr W. Taylor ii, v, viii. all Æ. in Ver. M. W. of W. Yorkſhire ii, v, ix. 4, 5. Wiltſhire iii, iv, v, vi, vii. both Reb. An. pr. 3 Æ. and 3 Par. 1 An. Mr J. Woolley v, vii. all Æ. in Ver. pr. 1 Æ. and 2 Reb. Mr. Geo. Watſon all Æ. but 7 in Ver. both Reb. Mr Roger Widger i, ii, v, vii, ix. pr. i Q. Mr John Watchorne ii, v, vi, vii. all Æ. in Ver. Par. both Reb. An. pr. 1 Q. 1 Æ. 1 Reb. Mr John Wiggleſworth i, ii, v, vii. Mr John Weller